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Accounting Quality and Debt Contracting

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ABSTRACT: We study the role of borrower accounting quality in debt contracting. Specifically, we examine how accounting quality affects the borrower's choice of private versus public debt market and how the design of debt contracts vary with accounting quality in the two markets. We find that accounting quality affects the choice of the market, with poorer accounting quality borrowers preferring private debt, i.e., bank loans. This is consistent with banks possessing superior information access and processing abilities that reduce adverse selection costs for borrowers. We also find that accounting quality has an economically significant but *differential* impact on contract design in the two markets consistent with differences in recontracting flexibility across the two markets. In the case of private debt, since there is greater recontracting flexibility, both the price (i.e., interest) and non-price (i.e., maturity and collateral) terms are significantly more stringent for poorer accounting quality borrowers, unlike public debt where only the price terms are more stringent. The impact of accounting quality on interest spreads of public debt is 2.5 times that of the private debt, since the price terms alone reflect the variation in accounting quality.

Keywords: *accounting quality; accruals; debt contracts; loan terms; public debt; private debt; loans; bonds.*

JEL Classification: *M4; G32.*

I. INTRODUCTION

Debt financing is a predominant source of new external funding for U.S. corporations. For instance, in 2005 the total new capital raised in the syndicated loan market (private debt) was $1,500 billion, and the corporate bond issuance amounted to

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about \$700 billion.[1] Given the economic importance of debt markets, we study the role of borrower accounting quality in debt contracting.[2] Specifically, we examine how accounting quality affects the borrower's choice of private versus public debt market and how the design of debt contracts varies with accounting quality in the two markets. Our results shed light on how lender characteristics, such as their information access and recontracting flexibility, play an important role in the manner in which lenders respond to the quality of accounting information of borrowers.

Our research questions are motivated by the prior literature that highlights significant institutional differences between the private and public debt markets. Lenders across these two markets differ with respect to their access to information, ability to monitor the borrower, flexibility in resetting contract terms, and the cost of renegotiating the contract.[3] Syndicated loans in private debt markets have concentrated lenders, i.e., banks, while public debt is held by dispersed arm's-length lenders, i.e., bondholders.[4] Banks have superior information-processing abilities and the lead bank on a loan has access to private information that is used to both design the terms of the contract and monitor the loan *ex post*. Firms are relatively more willing to share their proprietary information with a small group of lenders than with dispersed bondholders (Bhattacharya and Chisea 1995). This superior information access could reduce the adverse selection costs faced by borrowers with poor accounting quality and, consequently, affect the choice of lending market for the borrowers. Further, since coordination among private lenders is easier, the free-rider problem in monitoring the borrower is absent (Diamond 1984), and the private debt contract is easier to renegotiate relative to public debt. Consequently, we expect banks to have greater recontracting flexibility that would result in more customized contracts, varying in both price and non-price terms in response to borrower accounting quality, relative to bondholders.[5]

We focus on the quality of accounting information since financial statements are an important source of information for lenders in both markets at the time of debt initiations. The quality of accounting information impacts the lenders' estimates of future cash flows from which the debt repayments will be serviced. We measure accounting quality using the magnitude of operating accruals to proxy for the influence of discretionary accounting choices. Large abnormal operating accruals indicate unexpected deviations between earnings and operating cash flows that make it harder for the lenders to reliably estimate future operating cash flows. Our measure of accounting quality is the first principal component from three standard abnormal operating accrual metrics that have been used in accounting research (see Appendix B for a detailed description of the measures). This parsimonious measure reduces the measurement error associated with each of the individual abnormal accruals measures.

We find that accounting quality has a significant impact on the choice of private versus public debt. Accounting quality also affects debt contract design in systematically different ways depending on the lender's ability to process information and renegotiate the contract *ex post*. We show that borrowers with poorer accounting quality are more likely to choose private debt after controlling for the other determinants of the choice of private versus public debt. This is consistent with banks having superior information-gathering and processing abilities over bondholders, consequently reducing the adverse selection costs for borrowers with poorer accounting quality. However, borrowers with poorer accounting quality and high-growth opportunities appear to more likely choose public debt on the margin. This is consistent with growth firms with higher anticipated future financing needs attempting to avoid the information monopoly rent extraction by banks, as suggested by Rajan (1992).

---

[1] Source: Loan Pricing Corporation and Securities Industry and Financial Markets Association.

[2] Sloan (2001) notes, "there has been little research on the role of accounting information in financial contracting ... (despite) the extensive and explicit role of accounting information in debt contracts."

[3] Other differences that exist between the private and public debt markets include differences in liquidity due to trading of the debt instruments, seniority of the debt, etc., which are not the focus of this paper.

[4] A syndicated loan is a loan made by more than one lender and the typical syndicate consists of eight banks with one or two lead banks (Sufi 2007).

[5] Debt contracts vary on multiple dimensions such as price terms (interest cost) and non-price terms (maturity and whether it is collateralized).

Next, comparing the debt contracts across the two markets, we find that in the case of private debt there is substantial variation in all contract terms based on variation in borrower accounting quality. After controlling for firm characteristics, loan characteristics, and default risk, we find that firms with poorer accounting quality face significantly higher interest cost, lower maturity, and higher likelihood of posting collateral. Going from the lowest to the highest quintiles of accounting quality, there is a 14 basis points increase in interest spreads. This is a significant change because the median interest spread over London Interbank Offered Rate (LIBOR) for loans in the sample is 175 basis points. Similarly, controlling for firm characteristics, loan characteristics, and default risk, we find that moving from the lowest to the highest quintile of accounting quality reduces the maturity of the loans granted by one month and increases the probability of having to provide collateral by about 7.7 percentage points.[6]

In contrast, in the case of public debt, we find that the higher risk from poorer accounting quality is entirely reflected in the interest spread. After controlling for firm characteristics, bond characteristics, and default risk, we find that firms with poorer accounting quality face significantly higher interest cost. Moving from the lowest to the highest quintile in accounting quality, there is a 29 basis points increase in spreads. This is economically significant given that the median interest spread for bonds in the sample is 98 basis points. We find no evidence that maturity and collateral terms are more stringent in response to poorer borrower accounting quality.

We find significant differences between the two markets with respect to lenders' response to accounting quality. Comparing contract terms across the two debt markets poses some challenges. It is important to control for the fact that the borrowers' selection of debt markets is non-random, and the debt contract terms are observed for either the public or private debt market conditional on the choice of market. In order to account econometrically for the first-stage selection of debt market and compare contract terms across the two markets, we use an endogenous switching model (see Section IV, "Differential Impact of Accounting Quality on Contract Terms: Bank Loans versus Public Bonds" for details). We find that price impact of accounting quality (defined as the change in interest rate for a unit increase in accounting quality) in public debt markets is 2.5 times that of private debt markets. We also find a differential response to accounting quality between the two markets for the non-price terms (maturity and collateral). Private lenders set stringent non-price terms for poorer accounting quality borrowers, while public lenders do not. Together, these results reflect the impact of institutional differences between the two markets on the design of debt contracts in response to borrower accounting quality. Information access and recontracting flexibility allow private lenders to fine-tune debt contracts on both price and non-price dimensions. Borrowers potentially agree to more stringent non-price terms knowing that contracts can be renegotiated *ex post* with the arrival of new information. On the other hand, it appears that public lenders, lacking the flexibility to renegotiate, prefer to incorporate the impact of accounting quality purely in price terms.[7,8]

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[6] Note that a one-month difference in maturity is substantial considering short-term debt such as commercial paper has a three-month maturity.

One important concern is that our measure of accounting quality based on accruals might be a proxy for default risk. In order to ensure that our results are not merely capturing the effects of default risk, we construct a comprehensive metric of default risk that incorporates the Altman Z-score, the availability of a credit rating, the level of the Standard & Poor's rating, Ohlson O-Score, and an expected default frequency measure based on the Merton model. We find that the impact of accounting quality on debt contract terms is robust and incremental to firm default risk. This finding is interesting and suggests a role for accounting quality in influencing the cost of debt that is incremental to the measured credit risk of the firm. This is consistent with recent studies, including Duffie and Lando (2001), which provide an economic explanation of default, as structural models do, while recognizing the fact that market participants rely on incomplete and imperfect information.[9] The economic explanation they propose is that managers are either not able or not willing to communicate all their private information in the financial statements. They find that compensation for investors includes not only the "structural" credit risk premium, but also the "imperfect information" risk premium. Thus, the model provides a theoretical justification for why default risk is different from information risk.

In a similar vein, prior literature shows that information quality affects the estimation risk of firms (Barry and Brown 1984, 1985; Coles and Loewenstein 1988; Coles et al. 1995). If higher operating accruals are associated with lower reliability of operating cash flow forecasts, then they would reflect the risk of limited information about the borrower. Hence, an interpretation of our results could be that stringent contract terms for low accounting quality borrowers reflect lenders' compensation for information risk. This interpretation is consistent with Easley et al. (2002), Easley and O'Hara (2003), and Francis et al. (2005).[10]

Overall, our study provides new insights into how accounting quality, which can be thought of as a measure of information risk, and investor characteristics, proxied for by banks and arm's-length bondholders, determine the overall design of debt contracts. We contribute to the literature as follows. First, we show that accounting quality affects the borrowers' choice of the source of financing since different lenders have different information-gathering, processing, and renegotiating abilities. Second, we show that the characteristics of the lender affect the manner in which they respond to poor accounting quality. We find that lenders that possess greater recontracting flexibility modify several

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[7] The market price of the public debt can then change over time to reflect any new information on the accounting quality of the borrower, whereas the other contract terms remains unchanged over the term of the public debt.

[8] We also extend our analysis by using signed operating accruals to measure accounting quality. Income-increasing or income-decreasing accounting choices could be optimal borrower responses (Dichev and Skinner 2002; Asquith et al. 2003). Unreported results indicate that both public and private debt lenders appear to factor in the magnitude of operating accruals rather than the sign of the accruals in setting debt contract terms.

[9] Traditionally, the models for pricing debt are broadly classified into two groups. In structural models such as Merton (1974), full information, including the manager's private information, is used to price default, whereas in the reduced form models such as Jarrow and Turnbull (1995) default is priced based on information available to the market participants. Jarrow and Protter (2004) note that the distinction between the two classes of models is really a difference in the information set available to the modeler. More recently, models starting with Duffie and Lando (2001) propose a hybrid model in which default is priced based on firm fundamental characteristics as well as the information available in credit markets.

[10] Francis et al. (2005) provide evidence that information risk is priced in the case of equity and that it affects the aggregate interest cost. Our paper extends the evidence in Francis et al. (2005) since we examine the impact of accounting quality on both price and non-price terms in debt contracts. Further, by exploring the heterogeneity in debt markets, we are able to contrast the impact of accounting quality across the two debt markets and show how specific lender characteristics play a role in pricing of accounting quality.

contract terms to incorporate the risk arising from poor accounting quality, whereas arm's-length lenders that lack the ability to efficiently renegotiate, alter only the price terms.[11] Finally, we provide evidence that further supports the hypothesis that information risk is a priced source of risk distinct from default risk.

The rest of the paper is as follows. Section II discusses the literature and develops our hypotheses, Section III describes the data, and Section IV presents the research design and results from our analysis. Section V concludes.

II. RELATED LITERATURE AND HYPOTHESES

Background

According to Holthausen and Leftwich (1983), contracts to resolve agency conflict are usually written using numbers based on generally accepted accounting principles (GAAP) since it reduces the cost of contracting and monitoring. Leftwich (1983) provides evidence that even where contracts are written using non-GAAP metrics, the numbers are usually backed out from the corresponding reported GAAP numbers. As a result, GAAP could have an impact on the design of debt contract features. Prior literature on the role of accounting in debt contracts has tended to focus on either the reporting choices subsequent to the loan grant decision (Sweeney 1994; Dichev and Skinner 2002) or on contractual features that address changes in borrower credit risk of the borrower subsequent to loan grants (see Press and Weintrop [1990], Begley and Feltham [1999], and Beatty and Weber [2003] for evidence on loan covenants, and Beatty et al. [2001] for evidence on performance pricing features).[12]

Notably, Beatty et al. (2002) provide evidence on the impact of accounting flexibility granted at the time of loan origination and its effect on the interest cost of debt. Borrowers with more reporting flexibility, measured as the ability to include voluntary and mandatory accounting changes to compute covenant compliance, are charged higher interest costs.

In a related study, Francis et al. (2005) provide evidence on the impact of accounting quality on the interest cost of debt. Francis et al. (2005) focus on the *aggregate* firm level interest cost of outstanding debt and find that interest costs for lowest accounting quality firms are higher by 126 basis points relative to firms with the highest accounting quality. While their study provides an interesting first look at the role of accounting quality in debt markets, it has a few limitations in the research design and leaves several unanswered questions.

Unlike equity, debt contracts have multiple contract terms (interest, maturity, and collateral), and the role of accounting quality in the setting of multiple contract terms is not well understood. Lenders can fine-tune the risk-return relationship with the borrower by setting terms for not only the interest cost, but also the maturity term and collateral required in the contract. Focusing on the interest cost alone therefore potentially misestimates the total cost borne by borrowers. Further, debt markets are broadly stratified into a dispersed public debt bond market and a private debt bank loan market. Bondholders and banks differ significantly in their ability to process information and renegotiate contracts, and this has an important bearing on how accounting quality is incorporated into debt contracts. Consequently, accounting quality also should determine the choice of debt markets by borrower firms. Francis et al. (2005) compute the cost of debt as a weighted average of the interest costs arising from outstanding debt that may have been issued in different economic and accounting quality environments in the past. By examining the interest cost and other contract terms of *new* debt issuances and relating them to *concurrent* measures of accounting quality, we can enhance the confidence in the results reported in this paper.[13] Our paper addresses all these issues in the research design.

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[11] While differences in the ability to recontract *ex post* between public and private lenders is likely to be an important driver in the extent of customization of the debt contract, we cannot rule out the impact of other institutional differences between the two markets.

[12] Performance pricing terms are typically designed from a perspective of credit improvements, while credit deteriorations are handled with covenant provisions.

Accounting Quality and the Choice of Debt Market—Private versus Public Debt

Banks have better access to a borrower firm's private information relative to public bondholders, and prior literature on the choice of debt markets argues that private lenders have an information-gathering and processing advantage (Diamond 1991). Further, borrowers may be willing to reveal proprietary information to the lead bank of a loan syndicate or a small group of private lenders rather than to a diffuse group of public lenders (Bhattacharya and Chisea 1995). Therefore, firms with poor information environments potentially face higher adverse selection costs in the public debt markets. Consequently, we expect borrowers with poorer accounting quality to prefer bank debt over public bonds to resolve their information problems. This is summarized as Hypothesis 1.

Hypothesis 1: Information Benefits and Costs of Private Debt

H1a: Poorer accounting quality borrowers prefer private debt over public debt.

While banks are superior information processors and borrowers may face lower adverse selection costs, there is a dark side to this information advantage that banks possess. A potential cost borne by bank borrowers is the monopoly information rents that the bank can extract based on the private information they generate about the borrower (Rajan 1992). Information rent extraction by the bank is likely to be greater when accounting quality is poor since it makes the firm more opaque to outside lenders. Firms for which such information rents are likely to be costly are those with greater future financing needs, i.e., firms with high-growth opportunities. Since the potential for private information generation and rent extraction by the bank is higher for these firms, this yields our next hypothesis.

H1b: Poorer accounting quality borrowers that have greater growth opportunities are more likely to prefer public debt over private debt.

Accounting Quality and Price and Non-Price Terms—Private versus Public Debt

Since banks have superior access to information from the borrower and make investments in monitoring the borrowers, they do not face the same degree of renegotiation costs as dispersed public bondholders. The lower renegotiation costs provide lenders with incentives to write detailed and tailor-made contracts, breaches of which trigger renegotiation.

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[13] It is important to note that the magnitude of the impact of accounting quality on interest cost of debt we obtain is economically significant though of an order of magnitude smaller than those reported in Francis et al. (2005). Issues with variable measurement and regression specification might explain the difference in magnitude of the interest cost effects in our paper relative to theirs. For instance, they find that leverage is negatively related to the interest cost of debt in the multivariate tests and statistically significant with a t-statistic of –9.76. The authors are aware that the result is potentially inconsistent with the previous literature and intuition and suggest (Francis et al. 2005, footnote 5) that realized debt cost is a noisy proxy for the underlying construct. In contrast, by using debt cost at the time of initiation of the contract and by including default risk measures known to affect the cost of debt, we find that leverage is positively related to the cost of debt consistent with extant research. This enhances the confidence in the reliability of the results we obtain by relating accounting quality to cost of debt.

In contrast, public bonds are held by dispersed arm's-length investors, who are relatively unsophisticated compared to banks, and monitoring of the debt is costly because of the free-rider problem. Renegotiation and liquidation of collateral is also hard to achieve in the case of public bonds due to coordination problems among the dispersed investors. As a result Smith and Warner (1979) note that public bonds tend to have relatively boilerplate contractual features. Further, John et al. (2003) show that there is an agency problem between the firm and arm's-length bondholders regarding the use of collateralized assets since monitoring is not effective.

Therefore, in practice, private lenders such as banks have a greater recontracting flexibility as well as sophistication relative to public bond investors and can customize the price and non-price terms of the debt contract in response to borrowers' accounting quality. Consequently, we expect both price and non-price terms of bank loans to be influenced by accounting quality. Firms with poorer accounting quality should have more stringent private debt contract terms as measured by higher interest spread, shorter maturity, and a greater likelihood of being required to provide collateral.

In contrast, in the case of public debt, the Trust Indenture Act of 1939 requires that firms must receive the unanimous consent of public bondholders to alter any of the material terms (such as coupon, maturity, or collateral) of the bond indenture. Therefore, for practical purposes, maturity and collateral terms once set cannot be altered over the life of the contract for public debt. Thus, in the case of public debt and due to both the difficulty of renegotiation and lack of superior information-processing ability, we would expect the price terms, measured as the interest spread, to be the primary contractual feature used in response to accounting quality. This also would suggest that the price impact for a given level of accounting quality is more pronounced in case of public bonds than in case of bank loans. This is because, in equilibrium, a firm that faces a choice between public and private debt will be indifferent between the two options only if the marginal cost of an extra dollar raised by either means is equal.

The alternative view would be that due to the lack of renegotiation, initial contract setting is perhaps even more crucial in the case of public bonds, and thus price and non-price terms for public bonds should be more sensitive to differences in accounting quality of borrowers compared to bank loans. This is formalized in Hypothesis 2.

Hypothesis 2: Price and Non-Price Terms

H2a: Due to the differences in the flexibility in renegotiation, poorer accounting quality borrowers are expected to have more stringent price and non-price contract terms in the case of private debt, whereas only the price terms are affected in the case of public debt.

H2b: The impact of accounting quality on price terms for public debt is expected to be greater than that of private debt.

III. DATA AND VARIABLES

Our data covers all firms with private debt (bank loans) and public debt (bonds) issued during the period 1988–2003. The sample of bank loans is obtained from the Dealscan database provided by Loan Pricing Corporation. The Dealscan database contains information on loans obtained by firms and provides details of both price and non-price terms. The database is compiled using information from SEC filings and self-reporting on loan activity by participating banks. The database covers loans and other financing arrangements that have been originated globally since 1988. We select all loans for publicly traded U.S. firms for which loan and financial data are available. Some loan packages or deals can have several facilities for the same borrower and with the same contract date. We include each facility as a separate sample observation since loan characteristics vary with each facility. Our sample of loans contains term loans, revolvers, and 364-day facilities and excludes non-fund-based facilities such as standby letters of credit and very short-term bridge loans. All loans in our sample are senior in terms of the claim on the assets of the firm. We obtain the data on public bonds from the Securities Data Corporation (SDC) database for the period 1988–2003 and exclude any convertible bonds or bonds with callable features.

We exclude all loan and bond issues by utilities and financial institutions. The loans and bonds are matched with the Compustat database in order to ensure that all firms have accounting data available. We exclude loans (bonds) for which we are unable to obtain information about the loan spread (basis point spread). We require each firm in our sample to have the Compustat annual data for the fiscal year prior to the loan (bond) year so that we can compute the firm-specific controls and the accrual measures. The final sample contains 12,676 loans obtained by 3,261 firms and 3,681 bonds issued by 709 firms.

Accounting Quality

In order to measure accounting quality we use accruals-based metrics. We estimate the normal level of accruals for the firm using coefficients derived from industry-level cross-sectional models of accruals. Therefore, the abnormal operating accruals are relative to industry peers for a given year. The cross-sectional estimates overcome the drawback of using the firm-specific time-series estimation of abnormal accruals. Time-series models impose severe data restrictions that introduce survivorship bias in the sample. Further, changes in accruals due to business cycle effects are controlled for in the cross-sectional estimation process.

We interpret large unsigned abnormal operating accruals (hereafter "abnormal operating accruals" for ease of exposition) as reflective of higher deviations between cash flows and earnings of a firm. Large abnormal operating accruals make it harder for the debt investors to reliably discern the true economic performance of a firm. We compute three abnormal operating accrual metrics. The first measure, UAA_{DD} is based on a regression relating total accruals to past, current, and future cash flows of the firm as in Dechow and Dichev (2002). The second measure, UAA_{TWW}, is the absolute abnormal current accruals estimated following Teoh et al. (1998). The third metric, UAA_{MJ}, is based on the Modified Jones model derived from Dechow et al. (1995) based on Jones (1991). We compute each of these metrics for the fiscal year (t) prior to the loan (bond) date.[14] The basic approach we follow is to estimate the normal level of accruals and define abnormal accruals as the difference between the actual level and the normal level of accruals under each of the abovementioned models. The details are provided in Appendix B.

To ensure that our measures of accounting quality indeed reflect the difficulty in reliable estimation of cash flows, we ran a test (unreported) using the procedure in Dechow et al. (1998). First, using the entire Compustat data from 1982–2002, we classified each firm into a UAA quintile based on its median UAA rank over the sample period. Next, separately for each quintile we regress current cash flows on lagged cash flows and net income, controlling for firm fixed effects. The coefficients on the independent variables can be interpreted as the within-firm effects for cash flow predictability. We find that the fit of the regression is

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[14] In unreported tests, we use the signed versions of these metrics, SAA_{DD}, SAA_{TWW}, and SAA_{MJ}, to explore whether it is the magnitude or the sign that matters for setting of contract terms.

TABLE 7
Determinants of Loan/Bond Collateralization
Probit and Switching Regression Estimates of Secured on *AQ*, Firm, and Loan/Bond Terms

	Probit	Probit	Sample Selection	
	(Loan)	(Bond)	(Loan)	(Bond)
Intercept	−2.31***	−1.27*	−1.25***	−1.4**
	(0.30)	(0.73)	(0.30)	(0.67)
AQ	−0.07***	0.1	−0.05***	0.14*
	(0.01)	(0.08)	(0.01)	(0.08)
Leverage	−0.07	0.34	0.15	0.41
	(0.11)	(0.49)	(0.10)	(0.45)
Tangibility	−0.45***	2.53***	0.06	2.77***
	(0.10)	(0.34)	(0.09)	(0.31)
Market-to-Book	−0.06***	−0.16	−0.06***	−0.16
	(0.02)	(0.12)	(0.02)	(0.11)
Default Risk	0.52***	0.22***	0.35***	0.1
	(0.02)	(0.08)	(0.02)	(0.09)
Log(Maturity)	0.26***	0.14**	0.21***	0.13***
	(0.02)	(0.05)	(0.02)	(0.04)
Loan/Bond Concentration	0.11***	−0.11**	0.04**	−0.16***
	(0.02)	(0.05)	(0.02)	(0.04)
Obs.	12078	3681	12078	3681
Pseudo R^2	0.22	0.33		

Differences in the impact of Accounting Quality on collateralization between loan and bond markets (Sample Selection Model):

$$H_0\colon AQ_{\text{Bond}} = AQ_{\text{Loan}}$$
$$\chi^2(1) = 7.62$$
$$\text{p-value} = 0.00$$

, * Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

Refer to Appendix A for definition of variables.

Cluster (based on each firm's loans/bonds as a single cluster) and heteroscedasticity corrected standard errors are reported in parentheses. All regressions have dummies for year, which are not reported. The selection model corresponding to the sample selection regression corresponds to specification 2 in Table 3.

is significantly lower for higher accounting quality firms, whereas there is no relation in the case of bonds. This result is again consistent with H2a.

Overall, our single equation analysis suggests that while banks modify both the price and non-price contract terms in response to the cross-sectional variation in accounting quality, only the price terms are affected in the case of public debt. These results are consistent with H2a and support the idea that the superior information access and recontracting flexibility of banks allows them to respond differently to the cross-sectional variation in accounting quality relative to dispersed bondholders. In the next section we explicitly recognize the fact that market for debt choice is non-random (as indicated by our results in Table 4) and address the potential selection bias in the single equation results, while formally testing for differences in contract terms between the two markets in response to accounting quality.

Differential Impact of Accounting Quality on Contract Terms: Bank Loans versus Public Bonds

While the analysis in the "Single Equation Analysis" section can shed light on the impact of accounting quality on contract terms within each market (Loans and Bonds), we also wish to examine if accounting quality impacts contract terms differentially between the two markets. This task is econometrically challenging because the choice of loan or bond by the firm is non-random and systematically expected to depend on accounting quality (via our analysis in the "Choice between Bank Loans and Public Bonds" section).

We employ the endogenous switching model of Lee (1978) to solve our econometric problem, as outlined by Maddala (1983, 223–224). In this model, a switching equation sorts firms over two different states with one regime being observed for any given firm. In our application, the choice of public or private debt market is the selection equation, followed by two equations for the two regimes—one equation on spreads for private debt and one equation on spreads for public debt. We observe the contract characteristics of only one regime, either the loan or the bond choice made by the firm. We use the same approach for comparing maturity across the two markets. The model is described using two regression equations (one for loan and the other for bond) and a criterion function, I_i, that determines which regime the firm faces:

$$
\begin{aligned}
I_i &= 1 \text{ (Bond) if } \gamma Z_i + u_i > 0;\\
I_i &= 0 \text{ (Loan) if } \gamma Z_i + u_i \leq 0;\\
\text{Regime 1(Bond): } y_{1i} &= \beta_1 X_{1i} + \varepsilon_{1i} \text{ if } I_i = 1; \text{ and}\\
\text{Regime 2(Loan): } y_{2i} &= \beta_2 X_{2i} + \varepsilon_{2i} \text{ if } I_i = 0.
\end{aligned}
$$

Here y_{ji} are the dependent variables that correspond to the bond and loan contract terms (spread or maturity or collateral); X_{1i} and X_{2i} are vectors of independent variables; β_1, β_2, γ are vectors of the parameters. The three error terms are assumed to have a trivariate normal distribution. With this joint normality assumption, a full information maximum likelihood estimation can be used to fit the model and obtain consistent standard errors. It is not necessary for the vector Z_i in the selection equation to be different from the X_{1i} and X_{2i} vectors of independent variables for identification of the system. While the model could be identified by nonlinearities, we include exogenous variables that are unique to the selection equation and the second-stage regressions. In the selection stage, we include an indicator variable for whether the firm has accessed the bond market previously (*Capital Market Access*). In the second stage, we include dummy variables for year, loan/bond purpose and the other characteristics of the loan contract in all specifications in Tables 5–7 and in addition we include *Asset Maturity* in Table 6 and *Loan/Bond Concentration* in Table 7. These exogenous variables ensure that the model is well identified and increases the reliability of our estimates. After estimating the model's parameters, we wish to test if the coefficient on *AQ* in the bond equation is significantly different from the coefficient of *AQ* in the loan equation, with the null hypothesis that there is no difference between the coefficients. If the null hypothesis is rejected, then the result implies that the impact of accounting quality on the contract term under consideration is systematically different between the two markets. Since the model requires the dependent variable to be continuous, in the case of collateral we use a probit with a Heckman-style selection model and then compare coefficients across the two markets (Wooldridge 2002, 570–571).

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The results of the endogenous switching model for spreads are reported in Tables 5, 6, and 7 (the specifications labeled loan and bond under the label endogenous switching/sample selection). Since our selection model is the same as Specification 2 of Table 4, we do not report it here. The results are broadly consistent with the single equation results that form the first two columns. The test for the difference between the coefficients on accounting quality for private debt relative to public debt is reported at the bottom of the table. In case of interest spreads (Table 5), we find that the effect of *AQ* is significantly greater for bonds relative to loans with a p-value of 0.03. The difference between the coefficients on *AQ* for maturity (reported at the bottom of Table 6) is significantly different with a p-value less than 0.001, since only the loan maturity appears to be affected by *AQ* in the endogenous switching model. In the case of collateral as noted above, we employ a Heckman-style sample selection model for both the contract terms and then test for the differences. Similar to the spread and maturity results, the difference between the coefficients on *AQ* for the collateral specification (reported at the bottom Table 7) is also significant, with banks being more likely to require collateral for poorer accounting quality firms compared to public bonds (p-value less than 0.001). Interestingly, we find weak evidence that in the case of public debt, poorer accounting quality borrowers are less likely to provide collateral (the coefficient is significant only in the endogenous switching specification at 10 percent). This is consistent with John et al. (2003) who argue that agency costs associated with the collateralized asset make it costly to provide collateral in the case of public debt, and this effect is likely to be stronger when accounting quality is poor.

Overall, controlling for the endogenous choice of private versus public debt markets, we find that there are significant differences in the contract terms across the two markets in response to variation in borrowers' accounting quality. While the spreads in both markets are higher for poorer accounting quality borrowers, the effect is significantly greater in public debt markets. In case of non-price terms, the maturity is shorter and the borrower is more likely to be required to provide collateral if accounting quality is poor only in the case of private debt.

V. CONCLUSION

In this paper, we examine the impact of borrower accounting quality on debt contracting. Specifically, we examine the borrower's choice of private versus public debt markets; and then by contrasting the two markets we shed light on the role of lender characteristics in the design of debt contracts in response to variation in accounting quality. We measure accounting quality using a composite metric that utilizes the first principal component of three widely used measures of abnormal operating accruals. This yields a parsimonious measure of accounting quality that is higher for better accounting quality borrowers.

We find that the institutional differences between lenders in private debt markets (banks) and those in public debt markets (bondholders) play an important role in how accounting quality is incorporated into contracts. Banks have superior information-processing abilities, and consequently borrowers with poorer accounting quality prefer private debt in order to reduce the adverse selection costs. Further, we find that banks use both the price and non-price terms to customize the loan contract, whereas in the case of dispersed public bondholders, only the interest cost is affected by accounting quality, consistent with the ability of banks to renegotiate the contract *ex post*. Our results suggest that the institutional differences between the two markets play an important role in the design of debt contracts.

Overall, we provide new evidence on how the design of debt contract is affected by borrower accounting quality. Our results highlight the role of accounting quality in the choice of debt markets and the significant differences in contract design across public and private debt markets in response to variation in borrower accounting quality. We conjecture that accounting quality of the borrower proxies for the information risk associated with estimating future cash flows of the firm and, therefore, our results suggest that information risk is priced incremental to borrower default risk.

APPENDIX A
DEFINITION OF VARIABLES

AQ	Accounting Quality measured as the first principal component of UAA_{MJ}, UAA_{TWW}, and UAA_{DD} (defined below) multiplied by -1.
UAA_{MJ}	Unsigned Abnormal Accruals computed using the Modified-Jones model from Dechow et al. (1995). See Appendix B for details.
UAA_{TWW}	Unsigned Abnormal Accruals computed using the methodology in Teoh et al. (1998). See Appendix B for details.
UAA_{DD}	Unsigned Abnormal Accruals computed as the absolute residual from the regression of changes in working capital accruals on past, present, and future cash flow realizations as per Dechow and Dichev (2002) model. See Appendix B for details.
Leverage	Long-Term Debt (Compustat data item 9) divided by Total Assets (Compustat data item 6).
Log (Assets)	Log of Total Assets (Compustat data item 6).
Tangibility	Net PP&E (Compustat data item 8) divided by Total Assets (Compustat data item 6).
Current Ratio	Current Assets (Compustat data item 4) divided by Current Liabilities (Compustat data item 5).
Market-to-Book	Public value of equity plus the book value of debt (Compustat data item 6 – Compustat data item 60 + Compustat data item 24 * Compustat data item 25) divided by Total Assets (Compustat data item 6).
Log (Amount)	Log of the loan (bond) amount obtained from the Loan Pricing Corporation (Securities Data Corporation) database.
Log (Maturity)	Log of the maturity period (in months) of the bank loan (public bond) obtained from the Loan Pricing Corporation (Securities Data Corporation) database.
AIS Drawn over LIBOR	All-in-Drawn Spread charged by the bank over LIBOR for the drawn portion of the loan facility obtained from the Loan Pricing Corporation database.
Basis Point Spread	The interest spread in basis points on the public bond over the interest rate on a treasury of similar maturity, obtained from the Securities Data Corporation database.
Secured	Indicator variable that takes on the value 1 if loan facility/bond is secured with collateral, and 0 otherwise.
Default Risk	The first principal component of commonly used proxies for default risk such as Z-Score, O-Score, expected default frequency measure based on Merton (1974), indicator variable for whether the S&P rating was investment grade and an indicator variable for the presence of a credit rating for the firm.

Z-score	Altman's Z-Score computed as Z = 1.2 (working capital/total assets) + 1.4 (retained earnings/total assets) + 3.3 (EBIT/Total Assets) + 0.6 (Public value of equity/Book value of total liabilities) + (Sales/Total Assets).
O-Score	Ohlson's (1980) O-Score is computed as O = −1.32 − 0.407 (Log Total Assets) + 6.03 (Total Liabilities/Total Assets) − 1.43 (Working Capital/Total Assets) + 0.076 (Current Liabilities/Current Assets) − 1.72 (1 if Total Liabilities > Total Assets, 0 otherwise) − 0.521 (($\text{Net Income}_t - \text{Net Income}_{t-1}$)/($\lvert\text{Net Income}_t\rvert + \lvert\text{Net Income}_{t-1}\rvert$)).
Expected Default Frequency (EDF)	The probability that the firm value will fall below the value of debt, i.e., the probability of bankruptcy over the next year. The computation is based on the Black-Scholes-Merton option valuation model (see Appendix C for details).
Investment Grade	Indicator variable that takes on the value 1 if the S&P credit rating is investment grade (i.e., BBB and higher), and 0 otherwise
Not Rated	Indicator variable that takes on the value 1 if the firm has a credit rating, and 0 otherwise.
Capital Market Access	Indicator variable that takes on the value 1 if the firm has had a prior public debt issue, and 0 otherwise. This is constructed using the entire history of public debt issues from the Securities Data Corporation database.
Asset Maturity	$\frac{CA}{CA + PPE} * \frac{CA}{COGS} + \frac{PPE}{CA + PPE} * \frac{PPE}{Depreciation}$, as defined in Barclay et al. (2003). *CA* = Current assets; *PPE* = Property, Plant, and Equipment; *COGS* = Cost of goods sold.
Loan/Bond Concentration	Log of (Dollar amount of the loan or bond/Total Assets).
All Covenants	Indicator variable that takes on the value 1 if the bank loan has any covenants (both financial and general covenants), and 0 otherwise.
Financial Covenants	Indicator variable that takes on the value 1 if the bank loan has any financial covenants, and 0 otherwise.
Performance Pricing	Indicator variable that takes on the value 1 if the bank loan has any performance pricing features.

APPENDIX B
MEASURING ABNORMAL OPERATING ACCRUALS

We construct our measure of accounting quality (*AQ*) as the first principal component from three commonly used measures of abnormal accruals. We provide a detailed description of how we measure each of these below. We compute the absolute abnormal accruals for each firm using the cross-section of all firms in the industry for a given year following three models: (1) Dechow and Dichev (2002), (2) Teoh et al. (1998), and (3) Jones (1991) as modified by Dechow et al. (1995).

We define the accruals variable for firm *i* in year *t* as:

$$Total\ Accruals_{it} = TA_{it} = EBXI_{it} - CFO_{it}$$

where *EBXI* is the earnings before extraordinary items and discontinued operations (Annual Compustat data item 123) and *CFO* is the operating cash flows (from continuing operations) taken from the statement of cash flows (Annual Compustat data item 308 − Annual Compustat data item 124).[19]

We compute total current accruals using information from the statement of cash flow as:

$$\begin{aligned} \textit{Total Current Accruals}_{it} &= TCA_{it} \\ &= -(\Delta AR_{it} + \Delta INV_{it} + \Delta AP_{it} + \Delta TAX_{it} + \Delta OCA_{it}) \end{aligned}$$

where ΔAR is the decrease (increase) in accounts receivable (Annual Compustat data item 302), ΔINV is the decrease (increase) in inventory (Annual Compustat data item 303), ΔAP is the increase (decrease) in accounts payable (Annual Compustat data item 304), ΔTAX is the increase (decrease) in taxes payable (Annual Compustat data item 305), and ΔOCA is the net change in other current assets (Annual Compustat data item 307).

In the Dechow-Dichev model, a poor match between accruals and cash flows signifies low accrual quality or large estimation errors in the accruals. The following regression is estimated for each year for the each of the Fama and French (1997) industry groups:

$$\frac{TCA_{it}}{AvgAssets_{it}} = \theta_{0t} + \theta_{1t}\frac{CFO_{i,t-1}}{AvgAssets_{it}} + \theta_{2t}\frac{CFO_{i,t}}{AvgAssets_{it}} + \theta_{3t}\frac{CFO_{i,t+1}}{AvgAssets_{it}} + v_{it}. \quad (1)$$

The coefficients estimated from this industry regression are used to compute the fitted value for each firm, i.e., the normal current accruals, and we define SAA_{DDit} as the residual v_{it} from the regression. The first measure of abnormal operating accruals, UAA_{DDit}, is the absolute value of the residual ($|SAA_{DDit}|$).[20] All variables in the regression are scaled by average total assets (*AvgAssets*) in the current year.

For our second measure, we estimate the following regression based on Teoh et al. (1998) for each industry-year for total current accruals:

$$\frac{TCA_{it}}{Assets_{i,t-1}} = \gamma_{1t}\frac{1}{Assets_{i,t-1}} + \gamma_2\frac{\Delta Rev_{it}}{Assets_{i,t-1}} + \eta_{it} \quad (2)$$

where $Assets_{it-1}$ is firm i's total assets (Annual Compustat data item 6) for year $t-1$, ΔREV_{it} is the change in firm i's revenues (Annual Compustat data item 12) between year $t-1$ and t. The coefficients estimated from this industry regression are used to compute the normal current accruals (NCA_{it}) for each sample firm as:

$$NCA_{it} = \hat{\gamma}_{1t}\frac{1}{Assets_{i,t-1}} + \hat{\gamma}_2\frac{(\Delta Rev_{it} - \Delta AR_{it})}{Assets_{i,t-1}} \quad (3)$$

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[19] We follow Hribar and Collins' (2002) methodology for computing total accruals. Their methodology computes accruals directly from the statement of cash flows as opposed to changes in successive balance sheet accounts. While the differences in balance sheet accounts approach has been used in prior studies, Hribar and Collins (2002) show that this approach results in biased measures of accruals especially for firms with mergers and acquisitions or discontinued operations. Additionally, our measure of accruals is comprehensive and includes accruals from deferred taxes, restructuring charges, and special items besides the normal operating accruals; Hribar and Collins (2002) state that this is the most appropriate measure.

[20] All three measures of *UAA* and *SAA* are winsorized at the top and bottom 1 percent.

where ΔAR_{it} is the change in accounts receivable (Annual Compustat data item 2) between year $t-1$ and t for firm i. We then compute the abnormal current accruals as $SAA_{TWWit} = Signed\ Abnormal\ Accruals_{it} = (TCA_{it}/Asset_{it-1}) - NCA_{it}$. Our second metric for abnormal operating accruals is the absolute value of this abnormal current accruals, $UAA_{TWWit} = |SAA_{TWWit}|$.

Our third measure of abnormal operating accruals relies on the Jones model (Jones 1991) as modified by Dechow et al. (1995) to separate total accruals into normal and abnormal accruals. The absolute abnormal accrual derived from this model is our third abnormal operating accruals metric and defined as UAA_{MJ}. We first run the following cross-sectional regressions for each of the 48 Fama and French (1997) industry groups for each year based on the modified Jones model:

$$\frac{TA_{it}}{Assets_{i,t-1}} = k_{1t}\frac{1}{Assets_{i,t-1}} + k_2\frac{\Delta Rev_{it}}{Assets_{i,t-1}} + k_3\frac{PPE_{it}}{Assets_{i,t-1}} + \varepsilon_{it} \tag{4}$$

where PPE_{it} is the gross value of property, plant, and equipment (Annual Compustat data item 7) for firm i in year t. This regression is estimated for each industry-year, and the coefficient estimates from Equation (4) are used to estimate the firm-specific normal accruals (NA_{it}) for our sample firms:[21]

$$NA_{it} = \hat{k}_{1t}\frac{1}{Assets_{i,t-1}} + \hat{k}_2\frac{(\Delta Rev_{it} - \Delta AR_{it})}{Assets_{i,t-1}} + \hat{k}_3\frac{PPE_{it}}{Assets_{i,t-1}}. \tag{5}$$

Now the abnormal accruals are estimated as the difference between the total accruals and the fitted normal accruals as $SAA_{MJit} = (TA_{it}/Asset_{it-1}) - NA_{it}$. Our third metric of abnormal operating accruals is the absolute value of the abnormal accruals, $UAA_{MJit} = |SAA_{MJ}|$.

APPENDIX C
USING THE MERTON MODEL TO ESTIMATE PROBABILITY OF DEFAULT

Symbolically, the Merton model stipulates that the equity value of a firm satisfies:

$$E = VN(d_1) - e^{-rT}FN(d_2) \tag{1}$$

where E is the public value of the firm's equity, F is the face value of the firm's debt, r is the instantaneous risk-free rate, $N(\cdot)$ is the cumulative standard normal distribution function, and d_1 and d_2 are defined as:

$$d_1 = \frac{\ln(V/F) + (r + 0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}, \text{ and}$$

$$d_2 = d_1 - \sigma_V\sqrt{T}.$$

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[21] Following the methodology in the prior literature, we estimate the industry regressions using the change in reported revenues, implicitly assuming no discretionary choices with respect to revenue recognition. However, while computing the normal accruals, we adjust the reported revenues of the sample firms for the change in accounts receivable to capture any potential accounting discretion arising from credit sales.

This formula is the well-known Black-Scholes-Merton option valuation equation. The Merton model makes use of two important equations. The first is the Black-Scholes-Merton equation (described above), expressing the value of a firm's equity as a function of the value of the firm. The second relates the volatility of the firm's value to the volatility of its equity. Under Merton's assumptions the value of equity is a function of the value of the firm and time, and the volatilities of the firm and its equity are related by (Equation (2)):

$$\sigma_E = \left(\frac{V}{E}\right) N(d_1)\sigma_V. \tag{2}$$

The most significant step in implementing the model is to simultaneously solve Equations (1) and (2) numerically for values of V and σ_V. Once this numerical solution is obtained, the distance to default DD can be calculated as:

$$DD = \frac{\ln(V/F) + (\mu - 0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}$$

where μ is an estimate of the expected annual return of the firm's assets. The corresponding implied probability of default, sometimes called the expected default frequency (EDF), is then represented as:

$$EDF = N\left(-\left(\frac{\ln(V/F) + (\mu - 0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}\right)\right) = N(-DD).$$

To solve the model, we follow Bharath and Shumway (2007) by implementing an iterative procedure. First, we propose an initial value of $\sigma_V = \sigma_E[E/(E + F)]$ and we use this value of σ_V and Equation (1) to infer the public value of each firm's assets every day for the previous year. We then calculate the implied log return on assets each day and use that returns series to generate new estimates of σ_V and μ. We iterate on σ_V in this manner until it converges (so the absolute difference in adjacent σ_V's is less than 10^{-3}).

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Does ABC Information Exacerbate Hold-Up Problems in Buyer-Supplier Negotiations?

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ABSTRACT: Negotiations between buyers and suppliers that require sharing cost details to identify profitable relationship specific investments often fail and result in hold-ups. Based on inequity aversion, strategic uncertainty, and risk dominance criteria, we expect negotiators to be more reluctant to share fine information than coarse, less detailed information, which suggests that fine information systems can exacerbate hold-ups. When negotiators share fine information they achieve more efficient bargaining agreements. However, we find that strategic concerns about inequitable outcomes (fear of opportunistic behavior) lead fewer negotiating pairs to share fine information (where inequitable outcomes can be larger) than coarse information (where inequitable outcomes are smaller). Our results demonstrate that information fineness leads negotiators to trade-off potential utility losses due to fairness considerations and potential monetary gains. Fewer (more) negotiators chose to share fine (coarse) information and thus minimize fairness based utility losses (maximize monetary gains).

Keywords: *activity-based costing; hold-up problem; inequity aversion; buyer-supplier relations.*

Data Availability: *Data is available from the first author upon request.*

I. INTRODUCTION

Successful collaborative relationships between buyers and suppliers that generate cost-saving innovations often require the sharing of detailed proprietary information to identify investment opportunities that improve joint outcomes (Anderson and Dekker

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2005; Bensaou and Venkatraman 1995; McMillan 1990; Cole and Yakushiji 1984). However, exchanging valuable proprietary information opens the door to opportunism on the part of collaborators (Baiman and Rajan 2002a; Jap and Anderson 2003). Consequently, Baiman and Rajan (2002a, 268) have called for research that studies the "production efficiency/opportunism trade-off inherent in buyer-supplier networks." In particular, they suggest that a firm's choice of its internal accounting system (for example, its costing system) may provide data to network partners that could either mitigate or exacerbate opportunistic use of shared information.

We submit that when strategic uncertainty exists regarding whether a firm's proprietary cost information will be used for opportunistic (i.e., inequitable) behavior, negotiators will be less likely to share that cost information. Thus, our study investigates the tension between the need to share detailed information to achieve overall cost savings and the simultaneous impact of perceived risk of opportunistic behavior. We employ an experimental buyer-supplier negotiation to examine the following questions. First, when negotiators share (do not share) cost information, in particular relatively more versus less detailed cost information such as volume-based versus activity-based cost (VBC and ABC, respectively), is the overall profitability of negotiated agreements higher (lower)? Second, consistent with inequity aversion, strategic uncertainty, and risk dominance, does the potential for opportunistic behavior affect the relative willingness of negotiators to share cost information and in particular, more detailed ABC information? Third, how do market pressures in the environment that portend potential losses affect the observed sharing of cost information? Finally, in an *ex post* analysis we investigate whether the reluctance to share cost information affects the overall socially optimal level of investment negotiators attain (providing evidence of hold-up).

Our study contributes to the literature by modeling opportunistic behavior using inequity theory and showing how inequity aversion triggers strategic uncertainty and a risk dominance focus that results in lower levels of sharing of ABC compared to VBC information. The theory of inequity aversion proposed by Fehr and Schmidt (1999) predicts that some individuals, in addition to being purely selfish, also dislike inequitable outcomes. In particular, these individuals experience inequity if they are worse (or better) off than others. Further, the theory proposes that individuals suffer more from inequity if they are materially disadvantaged (the victim of opportunism) than from inequity that is to their material advantage (the perpetrator of opportunism). Inequity theory implies that in small numbers, bargaining situations where shared information can be used opportunistically, sharing finer information like ABC can result in a larger material disadvantage to the sharing negotiator than sharing coarser (VBC) information.

In our experimental setting, if *both* the buyer and supplier choose to share cost information, then the economic transparency of their supply chain increases and the Pareto-optimal equilibrium becomes apparent to both. However, if only one negotiator chooses to share, then the other, who does not share, is in a position to act opportunistically by appropriating all of the additional joint trade efficiencies. Thus, unless there is some mechanism in place to make sure both parties to the negotiation reveal their private information, strategic uncertainty about the other negotiator's sharing intentions influences a negotiator's choice about sharing information even when negotiators know that sharing could create the opportunity for a Pareto-superior outcome. In these circumstances negotiators focus on outcomes that minimize their potential losses, which are risk-dominant rather than Pareto-dominant equilibria. Overall, based on inequity aversion and strategic uncertainty about the choices of negotiating partners, we expect that finer ABC information is less likely to be shared than coarser VBC information.

lower for higher operating accrual firms, Q5, than the low operating accrual (total and abnormal accruals) firms, Q1. The lower predictability of future cash flows for high *UAA* firms provides support for our interpretation of *UAA* metrics as a proxy for accounting quality.

We also conduct analysis to make sure that accounting quality measured in the year prior to loan (bond) origination is indeed representative of long-run accounting quality of the borrowing firm. Since our tests of accounting quality are cross-sectional tests, we examine if the relative rankings of firms in accrual quintiles change significantly in the run up to the loan or bond, i.e., between three years prior to debt-year and the year prior to the debt-year. We rank all firms into *UAA* quintiles at the start and end of the run-up period and determine if the quintile rankings of firms change significantly. We find that 64 percent of the firms continue to stay in the same quintile or change by one rank. If we include changes by two ranks as well, then this number rises to 85 percent, i.e., only 15 percent of our firms have a greater-than-two-quintile change in their rankings in the run up to the loan. This gives us confidence that our measure of accounting quality does capture the underlying characteristic of the firm's financial information uncertainty.

The above methodologies generate three *UAA* measures that are all conceptually related to the level of accounting quality of each firm. However, we are interested in a parsimonious measure of accounting quality that allows us to examine cross-sectional differences across firms. We therefore use principal components analysis (PCA) to isolate the common component of firm-level accounting quality in our three proxies. We first cross-sectionally standardize each of the three measures by subtracting the mean and dividing by the standard deviation before applying the PCA methodology. We multiply the first principal component with -1 and label the resulting measure as *AQ*. Multiplying by -1 enables us to construct a metric that is increasing in accounting quality. The higher the level of *AQ*, the better is a firm's accounting quality. The first principal component explains on average about 60 percent of the corresponding cross-sectional sample variance. In addition, only the first eigenvalue is significantly greater than 1. We therefore conclude that one factor captures much of the common variation among the three proxies of accounting quality. This leads us to the following *AQ* measure for each firm for each fiscal year in the sample:

$$AQ_{it} = -(0.5709\,UAA_{DDit} + 0.6020\,UAA_{TWWit} + 0.5583\,UAA_{MJit}).$$

By construction, the mean of *AQ* is zero.[15] The *AQ* measure has several appealing properties. First, each component of the *AQ* measure enters with the correct (positive) sign. Second, the measure loads almost equally on all the three measures of accounting quality. Third, as can be seen from Table 1, Panel A, the Spearman rank correlations between the three components and *AQ* are very high, ranging from -71 percent to -74 percent and statistically very significant.[16] Fourth, the three individual measures also are significantly correlated with each other, but not as highly as with the index. This suggests that extraction of the common component using PCA and construction of the index is a parsimonious way of capturing accounting quality, and it reduces the measurement error associated with using the individual *UAA* measures.

We provide descriptive statistics for *AQ* and the three measures of unsigned abnormal operating accruals for our loan and bond samples in Table 1, Panel B. The *AQ* (and *UAA*s)

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[15] The de-meaning of the absolute abnormal accruals measures for the PCA analysis results in the *AQ* measure having a mean of zero. Thus the weighted average of the mean *AQ* in Table 1, Panel B is zero.

[16] The negative correlation between the *UAA*s and *AQ* is because *AQ* is multiplied by -1.

TABLE 1
Accounting Quality Measures

Panel A: Correlations between Accounting Quality Measures

	AQ	*UAADD*	*UAATWW*	*UAAMJ*
AQ	1			
UAADD	−0.739***	1		
UAATWW	−0.728***	0.477***	1	
UAAMJ	−0.712***	0.400***	0.416***	1

Panel B: Descriptive Statistics of Accounting Quality Measures

	Loans			Bonds			t-test
Variable	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Loan-Bond**
AQ	−0.133	0.325	1.420	0.457	0.687	0.830	−24.0***
UAADD	0.070	0.036	0.107	0.033	0.017	0.062	20.2***
UAATWW	0.077	0.037	0.153	0.040	0.016	0.130	13.4***
UAAMJ	0.197	0.067	0.512	0.093	0.030	0.293	11.7***

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*, **, *** Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

The overall sample contains 12,676 loans and 3,681 bonds obtained by firms over the period 1988–2003. The firm characteristics are obtained from Compustat and denote the values from the fiscal year prior to the fiscal year in which the loan or bond was obtained. The loan characteristics are from the Dealscan database provided by the Loan Pricing Corporation. The bond characteristics are from the SDC database.

Refer to Appendix A for definition of variables.

of the bank loan borrowers are significantly smaller (larger) than those of the public bond borrowers. The t-values for the difference between them is significant at the 1 percent level for *AQ* and the three individual *UAA* measures, indicating that firms that contract bank loans have significantly poorer accounting quality than firms that issue bonds.

Default Risk

It is important to recognize that accruals could capture a component of borrower default risk (Ng 2005; Janes 2005). Therefore, we measure default risk in our tests by using various proxies documented in the literature. In order to arrive at a comprehensive measure for default risk, we use the PCA methodology in a manner similar to that described in the "Accounting Quality" section. We use the first principal component of five different but common measures of default risk used in the literature. The five different measures are:

(1) Altman Z-score, computed using the specification Z = 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (EBIT/Total Assets) + 0.6 (Market Value of equity/Book Value of Total Liabilities) + (Sales/Total Assets).

(2) Ohlson O-score, computed following the implementation of Ohlson (1980). The O-score = −1.32 − 0.407 (Log Total Assets) + 6.03 (Total Liabilities/Total Assets) − 1.43 (Working Capital/Total Assets) + 0.076 (Current Liabilities/Current Assets) − 1.72 (1 if Total Liabilities > Total Assets, 0 otherwise) − 0.521 ((Net $\text{Income}_t - \text{Net Income}_{t-1})/(|\text{Net Income}_t| + |\text{Net Income}_{t-1}|)$).

(3) An expected default frequency measure (EDF) based on the Merton (1974) bond-pricing model. The expected default frequency measure captures the probability

that the firm value will fall below the value of debt, i.e., the probability of bankruptcy over the next year. The computation is based on the Black-Scholes-Merton option valuation model where equity is assumed to be a call option on the value of the assets of the firm and is shown in detail in Appendix C. It is similar to the default probability measure computed by Bharath and Shumway (2007).

(4) An indicator variable that measures whether the S&P credit rating of the firm is investment grade.

(5) A dummy variable for whether the firm has no outstanding credit rating, which assumes a value equal to 1 in the absence of any credit rating for the firm, and 0 otherwise.

We cross-sectionally standardize each of these measures and apply the PCA methodology and extract the first principal component as default risk defined as:

$$\begin{aligned}\text{Default Risk} = {} & 0.3064\ \text{Z-score} + 0.5141\ \text{O-score} + 0.4317\ \text{EDF} \\ & + 0.4258\ \text{Not rated} + 0.5237\ \text{Investment grade}.\end{aligned}$$

Table 2, Panel A provides both the summary statistics of default risk and its components for both the loan and bond samples. Firms in the loan sample have higher default risk than the firms in the bond sample, and this difference is significant at the 1 percent level for all the measures. Spearman rank correlations between the constructed default risk measure and its components, reported in Table 2, Panel B, are all of the right sign (a higher Z-score signifies a lower default risk of the firm), vary between 29 percent and 79 percent, and are all significant at the 1 percent level.

Firm Characteristics

We examine various firm characteristics besides default risk in our analyses of the debt contract terms. Using data from Compustat we use several other proxies for firm size and financial risk such as leverage, asset tangibility, current ratio, and market-to-book. Table 2, Panel C describes the characteristics of the sample firms separately for loans and bonds at the end of the fiscal year prior to the loan year. We find that firms issuing public bonds tend to be larger (by assets), more profitable, have greater tangible assets and leverage and lower current ratio than bank loan firms. All these differences are statistically significant the 1 percent level. We also note that the market-to-book ratio, while statistically different between the groups, does not seem to be economically different. The description of all the variables used in the paper is provided in Appendix A.

We then examine firm characteristics across the quintiles of accounting quality for the loan and bond samples. The results are reported in Table 2, Panel D. Leverage is higher for better accounting quality firms across both samples. Similarly higher accounting quality firms also have more tangible assets and lower market-to-book ratios. However while higher accounting quality is associated with larger firms in the case of bank loans, it is the reverse for the bond sample. Interestingly, while the loan sample firms with higher accounting quality also have lower default risk, there is no difference in default risk across quintiles in the bond sample.

Contract Terms of Bank Loans and Public Bonds

The main contract terms for loans and bonds that we analyze in this paper are the interest spread of the debt, the maturity, and whether the debt was collateralized. The cost of bank borrowing is measured as the drawn all-in spread (AIS drawn), which is measured as a mark-up over LIBOR and is paid by the borrower on all drawn lines of credit. Most of the bank loans are floating rate loans, and therefore the cost of the loan is quoted as a

TABLE 2
Firm Characteristics

Panel A: Descriptive Statistics of Default Risk Measures

	Loans			Bonds			t-test
Variable	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Loan-Bond**
Default Risk	0.259	0.256	1.371	−0.891	−1.179	1.019	47.3***
Z-score	1.927	1.982	1.594	1.744	1.524	0.957	6.6***
O-score	−0.678	−0.774	2.035	−1.206	−1.207	1.14	15***
EDF	0.083	0	0.203	0.019	0	0.093	18.6***
Investment Grade	0.208	0	0.406	0.745	1	0.436	−69.6***
Not Rated	0.575	1	0.494	0.248	0	0.432	36.3***

Panel B: Correlations between Default Risk Measures

	Default Risk	*Z-score*	*O-score*	*EDF*	*Investment Grade*	*Not Rated*
Default Risk	1					
Z-score	−0.293***	1				
O-score	0.658***	−0.350***	1			
EDF	0.589***	−0.213***	0.542***	1		
Investment Grade	−0.788***	−0.005	−0.290***	−0.345***	1	
Not Rated	0.633***	0.155***	0.083***	0.134***	−0.607***	1

Panel C: Descriptive Statistics of Firm Characteristics

	Loans			Bonds			t-test
Variable	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Loan-Bond**
Leverage	0.261	0.240	0.202	0.287	0.285	0.136	−7.4***
Assets	3182.6	461.1	9618.9	9510.4	5463.2	11621.8	−33.5***
Tangibility	0.347	0.295	0.227	0.532	0.553	0.224	−43.7***
Current Ratio	1.9	1.6	1.5	1.2	1.1	0.7	26.7***
Market-to-Book	1.7	1.4	1.3	1.7	1.3	1	2.6***

Panel D: Firm Characteristics by *AQ* Quintiles

	Loans					
	Low 1	**2**	**3**	**4**	**High 5**	**t-test (1)–(5)**
Leverage	0.212	0.248	0.274	0.287	0.304	−16.4***
Assets	1896.7	2386.4	2962.5	4425.0	5126.9	−12.6***
Tangibility	0.275	0.318	0.358	0.380	0.448	−26.9***
Current Ratio	2.1	2.1	1.9	1.8	1.6	9.4***
Market-to-Book	2	1.7	1.7	1.6	1.5	12.6***
Default Risk	0.674	0.363	0.233	−0.023	−0.157	20.7***

(*continued on next page*)

TABLE 2 (continued)

	Bonds					
	Low 1	2	3	4	High 5	t-test (1)–(5)
Leverage	0.249	0.28	0.27	0.289	0.304	−6.7***
Assets	11025.4	11155	9484.5	9155.9	8862.9	3.1***
Tangibility	0.439	0.472	0.494	0.540	0.589	−11***
Current	1.5	1.4	1.3	1.2	1.1	7.2***
Market-to-Book	2.3	1.9	1.7	1.6	1.5	10.6***
Default	−0.929	−0.860	−0.747	−0.970	−0.908	−0.3

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*, **, *** Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

The overall sample contains 12,676 loans and 3,681 bonds obtained by firms over the period 1988–2003. The firm characteristics are obtained from Compustat and denote the values from the fiscal year prior to the fiscal year in which the loan or bond was obtained. The loan characteristics are from the Dealscan database provided by the Loan Pricing Corporation. The bond characteristics are from the SDC database.
Refer to Appendix A for definition of variables.

spread over LIBOR. The interest cost of the bond is measured as the basis point spread (BPS) over a Treasury bond of similar maturity. We use the maturity in months for both bank loans and bonds and use an indicator variable for whether the debt is secured for both bank loans and bonds.

Table 3, Panel A describes the characteristics of bank loans and bonds in our sample. For bank loans, the mean (median) AIS drawn is 185.5 basis points (175.0 basis points), and the maturity is 41.6 months (36 months) for a facility size of 246.1 million (80 million); 48.8 percent of loans on average are secured. The mean (median) facility size as a percentage of firm assets (not reported) is approximately 23 percent (15 percent), indicating that bank loans are a significant source of financing for the firms in our sample. For public bonds, the mean (median) BPS is 133.0 basis points (98.0 basis points), and the maturity is 173.2 months (121.8 months); 18 percent of the bonds are secured. Thus, the bonds are larger in size (comparing the medians), of longer maturity, and less likely to be collateralized than bank loans.

IV. METHODOLOGY AND RESULTS

Univariate Analysis of Debt Contract Terms

We conduct a univariate analysis of price and non-price terms of private and public debt across quintiles sorted on the *AQ* measure from the lowest to the highest. We expect to find systematic differences in contract characteristics across the quintiles. We also perform a two-sample t-test for the null hypothesis, that the difference in contract characteristics between quintile 1 and quintile 5 is zero against the alternate hypothesis that the difference is not equal to zero. The results are reported in Table 3, Panel B.

We find that the interest spread is monotonically decreasing as the *AQ* increases for both private and public debt. Maturity is higher for the highest quintile of *AQ* relative to the lowest quintile for both samples; however, the difference is only marginally significant in the case of public debt. While the higher *AQ* firms are less likely to be secured in the case of private debt, they are more likely to be secured in the case of public debt. The

TABLE 3
Loan and Bond Terms

Panel A: Loan and Bond Terms

	Loans			
	n	Mean	Median	Std. Dev.
Facility Size ($ mil.)	12676	246.1	80	599.4
Facility Maturity (months)	12078	41.6	36	25.1
AIS Drawn over LIBOR (b.p.)	12676	185.5	175	134.5
Fraction Secured	12676	0.488		

	Bonds			
	n	Mean	Median	Std. Dev.
Bond Size ($ mil.)	3681	220.9	150	300.5
Bond Maturity (months)	3681	173.2	121.8	144.1
Basis Point Spread (b.p.)	3681	133	98	107.4
Fraction Secured	3681	0.180		

Panel B: Loan and Bond Terms by *AQ* Quintiles

	Loans					
	Low 1	2	3	4	High 5	t-test (1)–(5)
AQ	−1.995	−0.05	0.418	0.69	0.89	−67.7***
n	2989	2813	2613	2316	1945	
AIS Drawn over LIBOR (b.p.)	225.4	196.9	180.1	160.5	144.9	20.7***
Facility Size ($ mil.)	160.2	198.4	257.3	328.2	334.6	−9.1***
Facility Maturity (months)	37.8	42.6	43.7	42.6	41.8	−5.5***
Fraction Secured	0.595	0.549	0.48	0.415	0.336	−18.4***

	Bonds					
	Low 1	2	3	4	High 5	t-test (1)–(5)
AQ	−1.708	−0.014	0.452	0.716	0.92	−62.7***
n	293	462	659	960	1307	
Basis Point Spread (b.p.)	163.7	156.6	147.5	128.7	113.6	8***
Bond Size ($ mil.)	325	243.6	199.5	214.3	205.1	5.7***
Bond Maturity (months)	158.2	169.3	162.7	184.7	174.7	−1.8*
Fraction Secured	0.048	0.084	0.143	0.197	0.251	7.8***

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*, **, *** Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

The overall sample contains 12,676 loans and 3,681 bonds obtained by firms over the period 1988–2003. The firm characteristics are obtained from Compustat and denote the values from the fiscal year prior to the fiscal year in which the loan or bond was obtained. The loan characteristics are from the Dealscan database provided by the Loan Pricing Corporation. The bond characteristics are from the SDC database.
Refer to Appendix A for definition of variables.

latter result is consistent with John et al. (2003) who show that agency conflicts regarding the collateralized assets make it costly to provide collateral in the case of arm's-length public debt.

Choice between Bank Loans and Public Bonds

We begin the multivariate analysis by studying whether accounting quality influences the choice between private debt (bank loans) and public debt (bonds). As outlined in H1a, we expect that low accounting quality firms prefer private debt since banks have better information access and may incur lower information-processing costs when faced with poor accounting quality borrowers. Furthermore, banks can provide more flexible and tailor-made contracts for firms with lower accounting quality that would otherwise face relatively higher interest costs in public debt markets. We model the choice of the debt market accessed by the firm using a probit estimation where the dependent variable takes on the value 1 if the firm accesses public debt market, and 0 if the firm uses private debt for each debt observation in the sample. Our methodology is similar to Krishnaswami et al. (1999) and Hadlock and James (2002) who examine the choice between public bonds and bank loans.[17] The control variables used for the choice estimation and their construction are described in Appendix A and follow the existing literature.

The results are reported in Table 4. We find that in all specifications, the likelihood of public debt borrowing is significantly increasing in *AQ*. This is consistent with H1a under which poorer accounting quality firms seek private debt to reduce the associated adverse selection costs. Using Specification 2, we find that moving from the 1st to the 5th quintile in *AQ*, holding other variables at their mean, increases the probability of accessing the public bond markets by about 6 percent. For comparison, the unconditional probability of accessing the public debt markets in our sample is 22.5 percent (3,681 bonds out of 16,357 debt contracts). Thus, the effect of accounting quality on market choice is economically and statistically significant.

We then interact accounting quality with market-to-book in Specification (3) to test H1b. We find that low accounting quality firms with high-growth opportunities proxied by market-to-book are more likely to access public debt to avoid the information monopoly rent problems associated with private debt. Since *AQ* has a zero mean by construction, lower accounting quality firms have a negative *AQ*, and consequently the product of low accounting quality and high market-to-book is negative. Further, the coefficient on the interaction term is negative and significant, and consequently the net effect is that lower accounting quality firms with high market-to-book are more likely to prefer public debt, all else equal. We also find that larger firms and firms with more tangible assets, lower default risk, and prior capital market access prefer public debt over private debt financing.

Impact of Accounting Quality on Price and Non-Price Contract Terms of Bank Loans and Public Bonds

Single Equation Analysis

We examine the impact of accounting quality on contract terms (complementing the univariate analysis outlined in the "Univariate Analysis of Debt Contract Terms" section) by estimating OLS regressions of spread and maturity and a probit model for collateral. We model these contract terms as a function of *AQ*, the accounting quality and a set of control variables for the case of both bank loans and public bonds separately.[18] By examining the coefficient on *AQ* and its statistical significance, we can assess the impact of

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[17] Another commonly used measure of information asymmetry in these models is stock return volatility (Krishnaswami et al. 1999; Hadlock and James 2002). Replacing our *AQ* measure with volatility of stock returns produces qualitatively similar results and that firms with greater information asymmetry choose bank debt.

[18] The standard errors are cluster-adjusted taking each firm as a single cluster (Williams 2000).

TABLE 4
Choice of Lender—Bank Loans versus Public Bonds
Probit Estimates of Bond/Loan Choice on *AQ* and Firm Characteristics

	(1)	(2)	(3)
Intercept	−0.82***	−3.89***	−3.87***
	(0.03)	(0.16)	(0.16)
AQ	0.34***	0.1***	0.15***
	(0.04)	(0.03)	(0.03)
*AQ*Market-to-Book*			−0.02***
			(0.009)
Log(Assets)		0.3***	0.3***
		(0.02)	(0.02)
Market-to-Book		−0.01	−0.02
		(0.03)	(0.03)
Default Risk		−0.18***	−0.19***
		(0.03)	(0.03)
Tangibility		1.52***	1.5***
		(0.12)	(0.12)
Leverage		0.12	0.12
		(0.17)	(0.17)
Capital Market Access		0.24***	0.24***
		(0.07)	(0.07)
Obs.	16357	16357	16357
Psuedo R^2	0.05	0.31	0.31

*, **, *** Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

The dependent variable equals 1 of a firm accesses debt from the public bond market, and 0 otherwise.

Refer to Appendix A for definition of other variables.

Cluster (based on each firm's loans/bonds as a single cluster) and heteroscedasticity corrected standard errors are reported in parentheses.

accounting quality in the cross-section on firm's debt contract terms in both the private debt and public debt markets. We estimate bi-directional relationships between security and maturity, i.e., security is a function of maturity and *vice versa*. Further spread is modeled as a function of both maturity and security. These relationships can be justified by the existing literature (Dennis et al. 2000). In all our specifications we control for various firm characteristics, our composite default risk measure, and the other debt contract terms, consistent with prior studies. In case of the maturity specification, we also include asset maturity since firms match their debt maturity to asset maturity (Barclay et al. 2003).

The results for interest spreads are reported in Table 5 (the first two specifications labeled loan and bond). According to H2a, we expect to find that interest spreads are decreasing in accounting quality for both loans and bonds. Consistent with our hypothesis, we find that higher accounting quality results in significantly lower interest spreads in case of both private and public debt. Moving from the lowest to highest *AQ* quintile reduces the interest spread by 14 (29) basis points for loans (bonds). Spreads are increasing in firm leverage, decreasing in tangible assets, current ratio, and market-to-book. As expected the spread is increasing in the default risk. We find that longer-maturity bonds have a higher interest spread in the case of public debt, while it is not significant for private debt.

TABLE 5
Determinants of Loan/Bond Spread
OLS and Switching Regression Estimates of Loan Rates (AIS Drawn)/Bond Rates (Basis Point Spread) on *AQ*, Firm, and Loan/Bond Terms

	OLS	**OLS**	**Endogenous Switching**	
	(Loan)	**(Bond)**	**(Loan)**	**(Bond)**
Intercept	530.65***	129.37***	489.53***	111.67***
	(26.51)	(39.74)	(31.43)	(40.03)
AQ	−4.69***	−10.97***	−4.31***	−10.77***
	(0.96)	(3.04)	(0.98)	(2.99)
Leverage	56.37***	124.9***	61.78***	125.15***
	(8.90)	(26.10)	(9.23)	(25.94)
Log(Assets)	1.33	−22.38***	−6.92	−21.29***
	(1.80)	(2.79)	(3.72)	(2.77)
Tangibility	−22.49***	−33.9***	−30.71***	−32.02***
	(6.37)	(12.39)	(7.45)	(12.29)
Current Ratio	−2.11**	21.88***	−1.44	21.41***
	(1.00)	(3.83)	(0.99)	(3.77)
Market-to-Book	−7.06***	−12.94***	−7.99***	−12.94***
	(1.29)	(2.97)	(1.40)	(2.97)
Default Risk	30.51***	43.14***	31.08***	42.64***
	(1.76)	(3.88)	(1.77)	(3.88)
Log(Amount)	−20.89***	10.74***	−14.01***	9.92***
	(1.39)	(1.88)	(3.04)	(1.92)
Log(Maturity)	0.69	6.05***	−11.65**	9.82***
	(1.73)	(2.33)	(4.65)	(2.63)
Secured	77.72***	1.61	83.05***	−0.27
	(3.17)	(7.17)	(3.45)	(7.04)
Obs.	12078	3681	12078	3681
R^2	0.54	0.5		
LR test statistic (p-value)			16.34 (0.00)	

Differences in the impact of Accounting Quality on spreads between loan and bond markets (Endogenous Switching Model):

H_0: $AQ_{Bond} = AQ_{Loan}$
$\chi^2(1) = 4.28$
p-value = 0.03

*, **, *** Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

Refer to Appendix A for definition of variables.

Cluster (based on each firm's loans/bonds as a single cluster) and heteroscedasticity corrected standard errors are reported in parentheses. All regressions have dummies for year and purpose of the loan/bond, which are not reported. The selection model corresponding to the endogenous switching regression corresponds to specification 2 in Table 3.

Consistent with prior studies, including Berger and Udell (1990), secured loans bear a higher interest cost, consistent with riskier loans facing both higher interest costs and a collateral requirement.

The results for loan/bond maturity are reported in Table 6 (the first two specifications labeled loan and bond). We find that higher *AQ* firms get significantly longer maturity

TABLE 6
Determinants of Loan/Bond Maturity
OLS and Switching Regression Estimates of Log(Maturity) on *AQ*, Firm, and Loan/Bond Terms

	OLS	OLS	Endogenous Switching	
	(Loan)	(Bond)	(Loan)	(Bond)
Intercept	1.79*** (0.17)	3.68*** (0.36)	1.64*** (0.17)	3.51*** (0.39)
AQ	0.03*** (0.006)	−0.01 (0.020)	0.03*** (0.006)	−0.03 (0.020)
Leverage	0.62*** (0.05)	−0.04 (0.13)	0.61*** (0.05)	−0.21* (0.13)
Log(Assets)	−0.1*** (0.01)	−0.04** (0.02)	−0.12*** (0.01)	−0.19*** (0.05)
Market-to-Book	−0.004 (0.007)	−0.06*** (0.020)	−0.005 (0.007)	−0.06*** (0.020)
Default Risk	−0.04*** (0.009)	−0.09*** (0.020)	−0.03*** (0.009)	−0.02 (0.030)
Log(Amount)	0.13*** (0.01)	0.09*** (0.02)	0.14*** (0.01)	0.2*** (0.03)
Asset Maturity	0.0003 (0.0004)	0.008*** (0.003)	−0.00002 (0.001)	0.001 (0.003)
Secured	0.19*** (0.02)	0.15*** (0.05)	0.2*** (0.02)	0.29*** (0.06)
Obs.	12075	3681	12075	3681
R^2	0.19	0.13		
LR test statistic (p-value)			25.8 (0.00)	

Differences in the impact of Accounting Quality on maturity between loan and bond markets (Endogenous Switching Model):

H_0: $AQ_{Bond} = AQ_{Loan}$
$\chi^2(1) = 9.46$
p-value = 0.00

, * Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

Refer to Appendix A for definition of variables.

Cluster (based on each firm's loans/bonds as a single cluster) and heteroscedasticity corrected standard errors are reported in parentheses. All regressions have dummies for year and purpose of the loan/bond, which are not reported. The selection model corresponding to the endogenous switching regression corresponds to specification 2 in Table 3.

private debt, whereas there is no relation between accounting quality and maturity for public debt. This is consistent with our H2a. Firms with higher default risk face shorter maturity loans. Bond maturity is increasing in asset maturity, and the coefficient on secured loans is positive, consistent with banks agreeing to longer-maturity loans when the borrower provides collateral.

The likelihood of collateral is estimated using a probit model where the dependent variable takes on the value 1 if the loan or bond is collateralized, and 0 otherwise. We find in Table 7 (the first two specifications labeled loan and bond) that the likelihood of collateral

The results demonstrate that when detailed cost information (ABC) is shared, negotiating pairs achieve significantly higher trade efficiencies than when sharing VBC. However, sharing more detailed ABC information occurs at a significantly lower rate than sharing less detailed VBC information. As a result, negotiating pairs with ABC information (on average) capture significantly less of the total available market-wide trade efficiencies (evidence of widespread hold-up outcomes). In addition, we show that the prospect of losses brought on by market pressures results in a higher incidence of explicit cost information sharing than when no market pressure exists and profits can be maintained. However, the main effect of cost report type remains consistent across both profitable and unprofitable market conditions. Our results show that a finer internal accounting system (ABC), providing significantly more detail regarding a collaborator's cost structure than a coarser (VBC) cost system, creates significantly higher opportunities for productive efficiencies, but also magnifies the strategic uncertainty regarding opportunistic behavior.

The next section reviews the hold-up literature, explains how cost system type affects the ability of negotiators to identify trade efficiencies, explains the impact of inequity aversion on equilibrium outcomes, and develops hypotheses based on strategic uncertainty associated with those equilibrium outcomes. The experimental procedures are outlined in Section III and the results are analyzed in Section IV. Section V includes discussion, suggestions for future research, and concluding comments.

II. HYPOTHESES DEVELOPMENT

The Hold-Up Problem

The hold-up problem centers on investments that create more value inside the trading relationship than outside. For example suppose a supplier knows that investing in specialized quality training will reduce a particular buyer's downstream warranty costs. If the supplier suspects that the buyer is unlikely to pay for the training costs, then the supplier will be less likely to make the investment (hold-up problem), even though total value-chain costs would be lower. In single period, small numbers bargaining settings, neither market forces nor reputation effects are able to solve the problem of opportunistic behavior by a trading party. Also, contracting cannot always solve hold-up problems because, among other things, gains to trade on specific investments can be idiosyncratic and difficult to estimate or the specific investment itself can be difficult to estimate (e.g., human capital investments). Incomplete contracting and opportunistic expropriation combine to result in trading partners that invest at less than the socially optimal levels, resulting in foregone returns.

The underinvestment in trading partner-specific resources (hold-up problem) has been the focus of considerable analytical economic research. Modeling of the hold-up problem has focused on: the legal system's impact on hold-up (Edlin and Reichelstein 1996); the type of investment—cooperative versus selfish (Che and Hausch 1999); the role of unobservable investments (Baldenius 2000; Gul 2001); and the impact of supply chain architecture and incentives (Baiman and Rajan 2002a, 2002b). One important commonality in each of these models is the role of bargaining in solving hold-ups. For example, Baiman and Rajan (2002b, 231) point out that the incomplete contracting literature on hold-ups suggests that the demand for accounting information will in part depend first, on the extent to which renegotiation of contracts are allowed and, second, on the product's architectural interdependence. Our experimental design incorporates both product architecture issues and contract renegotiation.

Contract Renegotiation as a Means to Solve Hold-Up

Che and Hausch (1999) and Edlin and Reichelstein (1996), among others, suggest that hold-up can be resolved in some cases by an initial simple contract that allows for renegotiation after trade efficiencies are revealed (Chung 1991; Aghion et al. 1994; Nöldeke and Schmidt 1995). However, in these studies, trade efficiencies are assumed to be truthfully and willingly "revealed" simultaneously to (or by) both the buyer and supplier. In these models, no mechanism is specified for how trade efficiency information is conveyed to (between) negotiators. Thus, the mechanism by which these trade efficiencies (gains from trade) become known is an important part of understanding proposed resolutions of hold-ups.

Typically, accounting systems provide the information used to calculate trade efficiencies. Further, those accounting calculations are private asymmetric information between buyers and suppliers (see Baldenius [2000] for an example of asymmetric information and transfer price negotiations in a hold-up setting). Our research design allows us to study the revelation of asymmetric information between buyers and suppliers. We show that the revelation process is affected by the type of accounting system used and the basic economic setting of the firm (loss versus profit making).

Architectural Interdependence and Creating Productive Trade Efficiencies

Research has identified architectural interdependence as a significant idiosyncratic variable that motivates a need for information sharing between buyers and suppliers (Bensaou and Anderson 1999). Architectural interdependence is the extent to which the interface between the buyer's product and the supplier's component is critical to downstream profitability. When idiosyncratic architectural interdependence is present, sharing cost information is a necessary input to minimizing costs within the same value chain because one firm's choices (e.g., product design, delivery characteristics) inevitably affect the other firm's costs and investments. In these situations, detailed proprietary cost information, such as ABC information, is frequently required to identify the investments necessary for cost minimization.

ABC information is ideally suited for buyer-supplier collaborations when cost reduction is the objective and when the value chain is architecturally interdependent. Studies of successful implementations of ABC systems within firms find that the exchange of detailed overhead cost information results in identifying investments for optimal production and distribution configurations, better pricing and product mix decisions, and better management of costs and activities (Drake et al. 1999; Kaplan et al. 1997; Dedera 1996; Shields and McEwen 1996; Ness and Cucuzza 1995; Swenson 1995; Drumheller 1993). We designed our experiment based on an architecturally interdependent setting where sharing of more detailed ABC information will allow negotiators to identify cost-saving investment opportunities and increase trade efficiency.

Cost System Type

Our experiment manipulates the level of detail contained in an "official" cost report as a means to assess the impact of cost report type on negotiated trade efficiencies in an architecturally interdependent buyer-supplier setting. Architectural interdependence is present in each of six cost categories (e.g., setup, supervision, labor, materials) and in each category, the design characteristics affect each party's costs differentially. For example, the supplier's setup costs are determined by the size of raw materials (e.g., blocks) used in making a component. However, the size of materials also affects the buyer's testing costs (see Appendices A and B for details).

In the experiment, all negotiators, regardless of report type, are told the complete details about their firm's costs and cost drivers. Then, prior to the negotiations, negotiators are given *one* of the two types of "official" cost reports. One report format (ABC) provides a complete detailed description of all costs and drivers for their firm equivalent to that provided to them privately. A second official format (VBC) describes only the costs and drivers of materials and labor, leaving overhead as an allocated lump-sum (on a per-unit basis). The ABC format is consistent with activity-based costing methods and the VBC format with more traditional volume-based costing methods, which do not identify the costs or drivers of individual overhead components. Thus, the content of the official reports is such that all information contained in the VBC (coarse) report is contained in the ABC (fine) report; however, the ABC report contains additional detail on the costs and drivers of overhead (see Appendix A for a sample of the supplier's cost report).[1]

In our setting, face-to-face negotiators have options to verbally discuss their cost structures, and/or to share their "official" cost information by providing the other party with a copy of their cost report, or to not share any cost information. Although negotiators knew that they were free to verbally communicate any information they wished, they were also told that the only credible information was contained in "official" cost reports. Importantly, both members of each negotiating pair have the same type of cost report. That is, each paired negotiator has either activity-based cost reports or volume-based cost reports. Sharing an ABC report provides the opportunity for one or both parties to discover the most efficient cost-minimizing investment choice for each of six value-chain features. Sharing a VBC report identifies only three of the six possible cost-saving investments that will increase the negotiators trade efficiencies because it does not provide official information about overhead costs and drivers (see Appendices A and B for details).

Our first hypothesis predicts that when one or both negotiators choose to share official cost information, trade efficiencies will be highest when negotiators have ABC reports. Although not obvious to negotiators *ex ante*, when official information is shared the result is a coordination exercise where a negotiator with both sets of cost information can discover available trade efficiencies. Hypothesis 1 is a baseline prediction suggesting that negotiating pairs sharing official reports that provide more detail (ABC) about available cost reduction opportunities are expected to arrive at more efficient investment outcomes than those sharing less detailed (VBC) reports. We expect a strict dominance ordering where trade efficiencies from sharing ABC will dominate efficiencies from sharing VBC and sharing will dominate not sharing.

> **H1:** An interaction will exist such that negotiating pairs sharing ABC reports will reach agreements with higher trade efficiencies than those sharing VBC reports, and sharing VBC reports will create higher trade efficiencies than not sharing reports.

Information Sharing, Cost System Type, and Inequity Aversion

Hypothesis 1 implies that without sharing the official ABC information, the chance to reach the efficient solution is reduced. Thus, the importance of understanding the conditions under which negotiators are willing to share more detailed versus less detailed information becomes critical.[2] An important question then, concerns how much cost information negotiators are willing to share and what conditions motivate that sharing. Are negotiators more willing to share *some* cost information under some conditions, rather than none or complete detailed information?

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[1] The ABC report is mathematically *finer* than the VBC report in that it contains all the information of the VBC report and more (Newman 1980). Observed differences in behavior across the two cost report formats can be attributed to more (less) information being present in the ABC (VBC) report rather than that the two reports contain completely different information.

In our experimental setting, negotiators are informed that in the past, they had agreed on a standard casing sold for an average price of $145, resulting in a profit of $15 each as shown in column 1, Panel A of Table 1 (column 2 of Table 1 will be discussed later). For simplicity, this is labeled the *standard agreement*. The standard agreement consists of the compromise solution for each of six input characteristics (e.g., block size, packaging) and results in equal profits to both parties—although each party's profits and their equality are unknown to negotiators. The standard agreement reference point is important because: first, it represents the type of simple, *ex ante* contract discussed in the hold-up literature (Che and Hausch 1999; Edlin and Reichelstein 1996) and, second, it provides a benchmark against which to compare alternative agreements. In addition, negotiators were provided base knowledge about the final product's external market price. Thus, each negotiator could

TABLE 1
Profit and Available Efficiencies Calculations

	Column 1 No Market Pressure	**Column 2 Market Pressure**	
Panel A: Calculation of Individual Payoffs with the Standard Agreement			
Buyer:			
Revenue[a]	$290	$230	
Casing cost	(145)	(115)	
Production cost	(130)	(130)	
Buyer profit	$15	($15)	
Supplier:			
Revenue	$145	$115	
Production Cost	(130)	(130)	
Supplier Profit	$15	($15)	
Panel B: Calculation of Potential Trade Efficiency Gains			
Standard Casing			
Final Product selling price	$290	$230	
Buyer's incremental cost	(130)	(130)	
Supplier's cost to make	(130)	(130)	
Total profit (loss) available	$30	($30)	Incremental Trade Efficiency = $40
Optimal Casing			
Final Product selling price	$290	$230	
Buyer's incremental cost	(110)	(110)	
Supplier's cost to make	(110)	(110)	
Total profit (loss) available	$70	$10	

[a] The buyer's revenue, which is the final product selling price, was given and fixed at $290 ($230) in the no market pressure (market pressure) condition.

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[2] Drake et al. (1999) showed that participants with ABC information were unable to realize cost reductions unless the information was shared and used in a coordinated effort across multiple individuals.

compute the difference in their payoff outcome from the standard agreement due to a change in any of the six (three) input characteristics identified in the official ABC (VBC) report (see Appendix A). Each of the six (three) input characteristics have symmetric higher or lower cost implications for each negotiator. For example, the plastic base material cost for the supplier in the standard agreement is $15 per unit. As shown in Appendix B, Panel B, the supplier's base cost could be $10 higher (lower) if the negotiators agree to use a steel base (tin base). If the supplier chooses to share the official ABC report, then the buyer will know that if the *supplier* invests in higher (lower) material cost the *buyer* can reduce (increase) labor cost by $20 resulting in a net trade gain of $10 (loss of $10). However, without sharing, neither negotiator will know the cost distributions in detail. Overall, the total available joint trade efficiency gains beyond the standard agreement are $20 based on the VBC report and $40 based on the ABC report.[3]

Using game theory, we show an example of an *ex ante*, normal form representation of our experimental design in Table 2, Panel A. The numbers in each cell represent economically rational trade responses based strictly on *monetary* payoffs related to each negotiator's choice to share. The shaded cells represent Nash equilibria where if each negotiator has chosen a strategy, then no player can benefit by changing his/her strategy while the other negotiator keeps his/hers unchanged (the lower right [LR] cell in this example is the weakly dominant equilibrium). The upper left [UL] cell in Table 2, Panel A shows that when both negotiators choose to share *and* decide to split the total trade efficiencies ($40) equally, they both increase their individual profits above the pre-existing standard agreement by $20 ($10 for VBC). In our Panel A example, neither party will be made monetarily worse off by sharing and both have the possibility to be made better off by sharing.[4] However, in this example if one party chooses to share, then the other party would be better off choosing not to share (lower left [LL] and upper right [UR] cells). Thus, the UL cell is not a Nash equilibrium. Further, in the share/do not share cells (LL and UR) the party that does not share can identify the available trade efficiencies because they have all available information. Although economic theory suggests rational decision makers will take all available efficiencies and not share them with their negotiating partner, experimental evidence demonstrates that negotiators do share a small portion of efficiencies in situations similar to ours (Goeree and Holt 2001). If they do share some efficiencies, then the LL and UR cells are Nash equilibria.

In Table 2, Panel A we used utility functions based only on monetary payoffs. Notice that in one-sided sharing situations (LL and UR cells), the recipient of the shared ABC (VBC) report has both the information necessary to discover all (some) available cost saving options (i.e., create a larger pie) *and* the possibility to act opportunistically by taking all of the additional gains for their own profit.

Inequity Theory

The impact of potential opportunism on sharing behavior is not obvious in Table 2, Panel A. Utilities based on monetary payoffs and the assumption of economic rationality, do not provide a basis for predicting any sharing, let alone differential sharing between the

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[3] The optimal agreement involves casings made with steel bases and small red blocks that are shipped to the buyer unassembled, double-bagged, and in three weeks from the date of agreement. Total costs of the standard sales agreement equal $260, while the total costs of the optimal agreement are $220.

[4] By agreeing to a price that results in profits lower than the standard agreement, a negotiator could be made monetarily worse off by sharing. Because superior negotiating skills might enable a negotiator to persuade a partner to accept a lower price, we used negotiating experience as a covariate in hypotheses testing and found no significant effects.

TABLE 2
Normal Form[a] of the Experiment for Choosing to Share ABC or VBC Information

Panel A: Predicted Rational Economic Payoffs in Dollars

Supplier: **Buyer:**	**Share**	**Do Not Share**
Share:	**UL**	**UR**
ABC	(35, 35)	(15, 55)
VBC	(25, 25)	(15, 35)
Do Not Share:	**LL**	**LR**
ABC	(55, 15)	(15, 15)
VBC	(35, 15)	(15, 15)

Panel B: Utilities Using Inequity Aversion

Supplier: **Buyer:**	**Share**	**Do Not Share**
Share:	**UL**	**UR**
ABC	(35, 35)	(−25, 35)
VBC	(25, 25)	(−5, 25)
Do Not Share:	**LL**	**LR**
ABC	(35, −25)	(15, 15)
VBC	(25, −5)	(15, 15)

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[a] Cell designations are UR = upper right, UL = upper left, LR = lower right, and LL = lower left. Shaded cells represent Nash equilibria. For illustration, we assume that if the buyer shares and the supplier does not share (UR cell in Panel A), then the supplier captures all ABC (VBC) efficiencies of $40 ($20) from the shared information resulting in $15 + $40 ($15 + $20) or $55 ($35) payoff. In addition, the buyer captures no efficiencies, but maintains the payoff of the standard agreement ($15). Further, if both players share, then we assume each will improve their payoffs from the do not share choice and we show here an equal split of available efficiencies.

Panel B represents Fehr and Schmidt's (2003) inequity aversion utility function:

$$U_i(x) = x_i - \alpha_i \max\{x_j - x_i, 0\} - \beta_i \max\{x_i - x_j, 0\}$$

where values of $\beta = .5$ and $\alpha = 1$, and where $x_{i(j)}$ is player i (j)'s negotiated outcome.

ABC and VBC conditions. To understand the expected effect of opportunism on sharing behavior, we use a utility model based on the theory of inequity aversion. Inequity aversion, motivated by research showing fairness is important to negotiators, is based on experimental results showing that individuals care about both their own payoffs and also the differences between their payoffs and those of their negotiating partner (Fehr and Schmidt 1999, 2003; Camerer 2003). Social comparison research has shown that relative material payoffs affect people's behavior. Without the assumption that at least for some people relative payoffs matter, it is nearly impossible to make sense of empirical regularities observed in many experiments and archival studies. For example, relative payoff considerations have been shown to be an important constraint for the internal wage structure of firms (Agell and Lundberg 1995; Bewley 1998). These comparison-related fairness judgments are based on some type of neutral reference outcome (in our case, the standard agreement). The relevant reference outcome for our experimental setting is the pre-negotiation status quo (see Table 1, column 1 and Table 2, Panel A, LR cell).

To explain inequity aversion, Fehr and Schmidt (2003, 274) use the following simple, two-person model:

$$U_i(x) = x_i - \alpha_i \max\{x_j - x_i, 0\} - \beta_i \max\{x_i - x_j, 0\} \tag{1}$$

where x denotes the monetary payoff and U denotes the utility function of player i or j and it is assumed that $\beta_i \leq \alpha_i$ and $0 \leq \beta_i < 1$. An important part of the model is that the utility loss for player i, from a disadvantageous inequity where $x_j > x_i$ is larger than the utility loss when $x_i > x_j$, an advantageous inequity. Note that $\beta_i \leq \alpha_i$ implies that a subject is loss-averse in social comparisons, consistent with tenets of prospect theory. That is, negative deviations from the reference outcome have a larger impact on negotiator's utility than positive deviations.[5]

To relate inequity theory directly to our experiment, assume the common values of $\beta = .5$ and $\alpha = 1$ (see Fehr and Schmidt 2003, 289). For any agreement with an equal split of profits, the buyer's and supplier's utility will be equal (i.e., 15 for the standard agreement). Now, consider the two outcome distributions shown in Table 2, Panel B in the LL and UR cells. In these two cells, we again assume that the additional ABC trade efficiency of $40 is entirely captured by the negotiator that chooses not to share information (see Appendix C for a more general analysis). In these two cells, the buyer's ABC and VBC inequity-related utilities are as follows:

$$\text{LL cell: } \begin{cases} U_{ABC\text{-}Buyer} = 40 - 1\ (0) - .5\ (40 - 0) = 20\ (20 + 15 = 35 \text{ utils}); \\ U_{VBC\text{-}Buyer} = 20 - 1\ (0) - .5\ (20 - 0) = 10\ (10 + 15 = 25 \text{ utils}); \end{cases}$$

$$\text{UR cell: } \begin{cases} U_{ABC\text{-}Buyer} = 0 - 1\ (40 - 0) - .5\ (0) = -40\ (-40 + 15 = -25 \text{ utils}); \text{ and} \\ U_{VBC\text{-}Buyer} = 0 - 1\ (20 - 0) - .5\ (0) = -20\ (-20 + 15 = -5 \text{ utils}). \end{cases}$$

The utility outcomes based on the above computations are displayed in Table 2, Panel B. Panel B illustrates several points. First, inequity aversion implies a larger potential decrease in utility from sharing ABC (a decrease of 40) compared to VBC (a decrease of 20). Second, inequity has a larger impact on utility when there is a comparative disadvantageous outcome for the negotiator. More importantly, the Nash equilibria are different from Panel A. In Panel B the two equilibria are the UL and LR cells with the UL being Pareto optimal.

Cost Report Type, Strategic Uncertainty, and Risk Dominance

Given the Pareto-dominant equilibrium that exists in Panel B of Table 2, one would initially predict that high sharing would occur with both ABC and VBC reports. However, when multiple equilibria exist (the UL and LR cells), negotiators will have strategic uncertainty about which equilibrium the other negotiator will use. Further, when the equilibria are not interchangeable as in Panel B, strategic uncertainty will influence negotiators' behavior. Even when equilibria can be Pareto ranked (as in Panel B where UL is Pareto superior to the LR) experimental evidence shows negotiators implement strategies that consequently result in failure to coordinate on the Pareto-dominant cell (Van Huyck et al. 1990). In our setting, this occurs because negotiators cannot be sure whether their negotiating partner will choose to share their cost information.

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[5] Fehr and Schmidt (2003, 276) also assume for simplicity that the utility function is linear in inequality aversion as well as in x_i.

The strategic uncertainty inherent in negotiators' choices is a result of the related off-equilibrium cells in Panel B, Table 2. When strategic uncertainty exists about whether negotiating parties will share information, then risk dominance has been shown to be a strategy that captures the decision maker's expected cost of being on the wrong side of the other's choice (the off-equilibrium cells). In these cases, a negotiator assesses their potential opportunity cost in deviating from an equilibrium strategy if the other negotiator does not deviate and continues to play the original equilibrium strategy. The risk-dominant equilibrium (Harsanyi and Selten 1988) is the equilibrium for which unilateral defection to the other equilibrium produces the highest opportunity cost. In our setting, the risk-dominant equilibrium is the LR cell where no sharing occurs. To see this, consider the equilibrium cells in Panel B for ABC information. In the UL cell, if the buyer deviates from the share strategy and chooses the do not share strategy, then the buyer gains nothing (change in utility is from 35 to 35). However, if a buyer deviates from the equilibrium do not share strategy (LR cell), then utility decreases by 40 (from 15 to −25). Because negotiators incur the highest opportunity cost by deviating from the do not share equilibrium, it is the risk-dominant equilibrium (for a more general analysis see Appendix C).[6] In previous research with strategic uncertainty, a risk-dominant equilibrium has been shown to dominate a Pareto-optimal equilibrium. In these cases, decision-maker behavior results in inefficient equilibrium outcomes (Harsanyi and Selten 1988; Van Huyck et al. 1990, 1991; Straub 1995; Anctil et al. 2004).

Risk-dominance ordering predicts the expected difference in the sharing outcomes between the ABC and VBC conditions. Table 2, Panel B shows that with an ABC (VBC) report a negotiator who chooses to share while the other does not, could reduce his/her inequity based utility by 40 (20) points. Straub (1995, 350) showed that there is a trade-off between the extent to which one equilibrium is payoff-dominant and the extent to which the other equilibrium is risk-dominant. He showed that as the difference in risk dominance between two equilibria becomes smaller, then payoff dominance will have a stronger influence on the selection of an equilibrium. Thus, with a VBC report the risk dominance outcome of the LR cell is smaller relative to the payoff dominance outcome of the UL cell. Thus, the payoff dominance of the UL cell will have more influence on equilibrium selection with VBC reports than with ABC reports. Risk-dominance ordering suggests that ABC negotiators (where inequity-based opportunity costs are larger as a result of deviating from the risk-dominant equilibrium) will be less likely to share than VBC negotiators.

Figure 1 shows the payoff spaces available to negotiators. From the figure it is clear that there are many more available negotiated outcomes than portrayed in our Table 2 example. The solid line indicates the frontier for the standard casing agreement. The dashed line provides the frontier for the maximum trade-efficient agreement. However, agreements are possible at any point on or below the dashed line. Negotiating pairs that do not share information could theoretically, given enough time and patience, arrive at points E or F for example. Alternatively, even if negotiating pairs share information, they may not agree on

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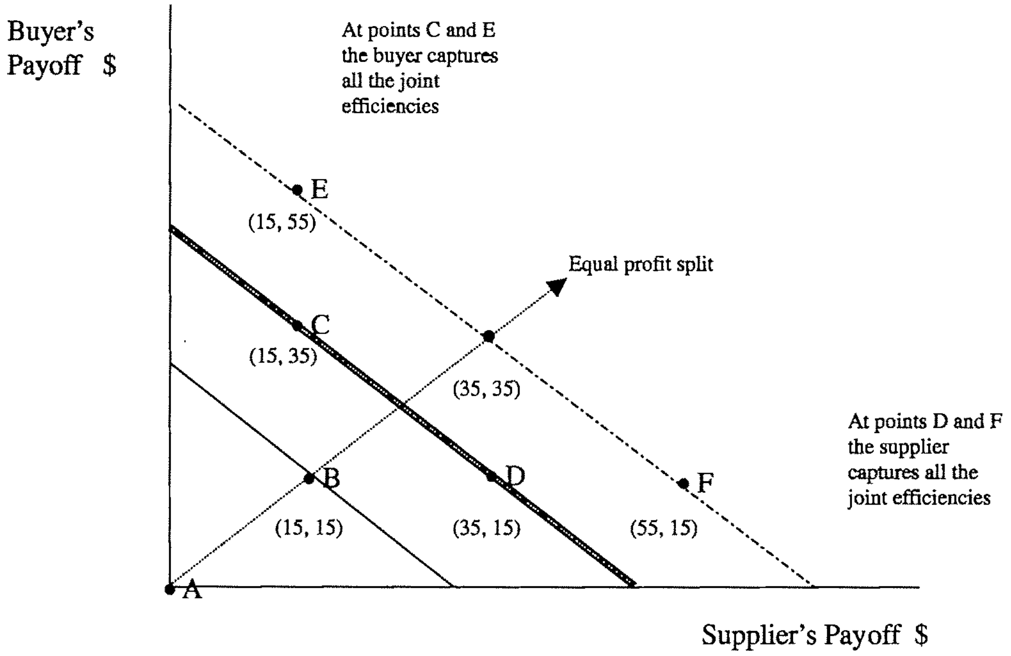
[6] In 2 × 2 games, the Nash product can be used to determine risk dominance. The Nash product is simply the product of the losses associated with deviating from the equilibrium. The equilibrium with the largest Nash product is risk dominant. In Table 2, Panel B the Nash product of the UL ABC (VBC) cell is 0 (0) and the Nash product of the LR ABC (VBC) cell is 40 × 40 = 1600 (20 × 20 = 400).

FIGURE 1
Trade Efficiency Gains from Sharing VBC or ABC Reports


Buyer's Payoff $
At points C and E the buyer captures all the joint efficiencies
E
(15, 55)
Equal profit split
C
(15, 35)
(35, 35)
At points D and F the supplier captures all the joint efficiencies
B
D
F
(15, 15)
(35, 15)
(55, 15)
A
Supplier's Payoff $

——— Standard casing payoff frontier.
═══ Official VBC report payoff frontier.
- - - - Official ABC report payoff frontier.

——▶ Equal payoff split.

- Point A represents no agreement payoffs (worst outcome).
- Point B represents equal payoffs for the standard agreement.
- Points C and D show opportunistic payoffs if optimal VBC features (labor and materials) are agreed upon. At C (D) the buyer (supplier) gains all benefits from sharing (those beyond the standard agreement).
- Points E and F show larger opportunistic payoffs if optimal ABC features (labor, materials, overhead) are agreed upon. At E (F) the buyer (supplier) gains all benefits from sharing (those beyond the standard agreement).

the most efficient outcome. Certainly, as is true in any negotiating setting, individual characteristics (i.e., negotiating skill, familiarity with cost information) can impact outcomes.

If, as predicted by inequity theory, negotiators have higher disutility for disadvantageous inequitable outcomes, then we predict they will be less likely to share the official ABC report that includes six characteristics with a higher total potential opportunity cost of $40 as illustrated by points E or F in Figure 1. Negotiators will be more likely to share their VBC (than ABC) report because the VBC report identifies only three disadvantageous opportunity costs totaling $20 as illustrated by points C or D in Figure 1. We predict, consistent with inequity aversion, strategic uncertainty, and risk-dominance ordering that the proportion of negotiating pairs that choose to share their cost reports will be smaller in the group with more detailed (ABC) cost reports than in the group with less detailed (VBC) cost reports. "Sharing" is measured as the proportion of negotiating pairs in which one or both negotiators choose to share their cost report.

> **H2:** The proportion of negotiating pairs that choose to share their cost reports will be greater among those that have the option to share a VBC cost report than among those that have the option to share an ABC cost report.

Competitive Markets and Information Sharing

An additional interesting question is what motivates cost sharing. Some successful buyer-supplier partnerships exist in highly competitive market conditions that could have a significant detrimental affect on the financial condition of the firm(s) involved. Prospect theory provides an explanation of the link between competitive market pressures and an increased willingness of firms to collaborate with customers or suppliers by sharing information. Given that firms under such market conditions are likely to be facing actual or potential losses for the near future, the managers of these firms are also facing "losses" in the form of lower pay if their compensation is tied to firm performance (or in the extreme, lack of employment). The seminal work of Kahneman and Tversky (1979) demonstrates that in choice problems involving risk and uncertainty, individuals behave differently depending on whether they are making decisions within the context of perceived gains or losses. In general, prospect theory predicts that individuals will exhibit risk-seeking behavior when facing potential losses, and risk-averse behavior when facing potential gains.

Recall that the experimental context examined involves the choice of whether or not to share cost information during a negotiation between a buyer and supplier. We include an experimental condition we refer to as (no) market pressure. In the (no) market pressure condition, the buyer and supplier are initially placed in a (gain) loss situation. That is the initial standard agreement results in an equal (gain of \$15) loss of \$15 per unit to both the buyer and supplier (see Table 1, column 2). As a result, the negotiators, in the market pressure condition, face the prospect of potential losses unless some other agreement is reached. Thus, the presence or absence of market pressure induces a loss or gain frame of reference, respectively.

The proposed shape of the utility function under prospect theory, combined with the assumption that sharing cost information is riskier (more likely to create inequity aversion) than not sharing, leads to the prediction of more frequent cost information sharing under the market pressure condition. Hypothesis 3a is stated as follows:

> **H3a:** The proportion of negotiating pairs that choose to share their cost reports is greater under the presence of market pressure than in the absence of market pressure.

One interesting question is: Will the effect of the loss condition be significantly strong enough to overcome the reluctance to share detailed ABC information? No apparent theory or evidence suggests that loss aversion will dominate inequity aversion. Consequently, if H2 and H3a hold, we predict the following interaction:[7]

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[7] If we observe significant results for H2 and H3a, it may seem that the significance of H3b is a foregone conclusion. However, a focused test of H3b is needed because the results of H2 and H3a can be obtained if an ordinal interaction is present (i.e., the mean in one cell is significantly higher/lower than the means in the other three cells, which are approximately equal to each other).

H3b: The highest proportion of negotiating pairs sharing cost reports occurs when market pressure is combined with the VBC report format; the lowest proportion of pairs sharing cost reports occurs when no market pressure is combined with the ABC report format.

The next section of the paper provides a more thorough description of the experimental manipulations and procedures followed in testing the above hypotheses.

III. RESEARCH METHOD

The study employs a 2 × 2 experimental design with the level of detail contained in official cost reports and the presence/absence of market pressure as independent variables. The dependent variables include the percentage of negotiating pairs that share their cost reports, the amount of trade efficiencies captured by the agreements reached and the amount of total available efficiencies captured in each condition.

Subjects, randomly assigned to the role of either buyer or supplier, negotiated the price and design characteristics of an intermediate, architecturally interdependent component, called a "casing," during a face-to-face meeting. Buyers used casings in their final product. Final products were sold in the market at a fixed price. The casings are architecturally interdependent because both buyers and suppliers incur materials, labor, and overhead costs that vary depending on the agreed-upon characteristics of the casing and, importantly, the configuration of the supplier's characteristics affect the downstream profitability of the final product (potential for hold-up). In all conditions, buyers were aware of all of their own costs and cost drivers, but not of the supplier's and vice versa (asymmetric information exists prior to the negotiation).

Prior to the negotiation, buyers and suppliers were separated and given instructions and background information according to scripts prepared for each experimental condition. As part of the background information, negotiators were informed of a standard sales agreement that had been agreed to in past negotiations. The standard sales agreement, consisting of a selling price and a given set of casing characteristics, provided a reference point against which alternative offers could be compared.

The market pressure effect (presence versus absence) was manipulated through both the payoffs from the standard sales agreement and by differences in the description of market conditions given to subjects.[8] In the presence of market pressure, the standard agreement resulted in an equal moderate loss, ($15), to both parties. In the absence of market pressure, the standard agreement yielded an equal moderate profit, $15, to both parties (see Table 1). Standard payoffs were manipulated via the selling prices of both the standard casing and the final product. The presence of market pressure had the effect of driving these prices down to below profitable levels given production costs.

Each negotiator had private information about how their own costs changed depending on the characteristics of the casing, but not how their negotiating partner's costs changed (see Appendix B, Panels A and B). In addition, each negotiator had an "official" cost report that they could choose to share with their negotiating partner or keep confidential. The option to share more versus less detailed cost information was manipulated via the format of the official cost report. The ABC format contained detailed information concerning the costs and drivers of materials, labor, and overhead (see Appendix A). The VBC format presented the cost drivers and related costs for only labor and materials, while leaving overhead as an allocated (per unit), lump-sum cost (see Appendix A). Thus, subjects with an ABC report that chose to share it would reveal all their information regarding production costs. In contrast, subjects with a VBC report that chose to share could retain specific information regarding overhead costs and drivers. In all conditions, buyer/supplier pairs had the same cost report format.

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[8] Under the market pressure condition buyers were told: "Currently, the industry that buyers operate in is facing very stiff competition from overseas producers. As a result the selling prices of both the buyer's product and the supplier's casings have fallen to below profitable levels."

If an ABC report was shared, then the receiver could calculate the sharer's dollar payoffs to any agreement. Mutual sharing of cost reports revealed to both parties the changes to the standard casing that could increase the total available profits. As shown in Panel B of Table 1, the total costs per unit incurred across the two firms could be reduced from the standard agreement by $40 if the negotiators agreed on the optimal combination of casing characteristics.

A key aspect is that each negotiable feature involved conflicting preferences, but only one feature was a cost-minimizing option. As part of the cost report manipulation, negotiators in both the ABC and VBC condition were told that sharing their cost report could result in figuring out cheaper ways to produce casings (i.e., a Pareto-superior solution to not sharing). However, they were also told that if they shared, then their negotiating partner could use the information to obtain a better deal for themselves and, if they agreed, potentially reduce their share of the profits. Thus, subjects were informed that, if they agreed, their payoffs could be higher or lower when they shared than if they chose not to share.

Following the initial instruction period, all subjects were brought together and shown a scripted demonstration of a sample negotiation. The purpose of the demonstration was to ensure that subjects understood how to use the proposal form and how to go about making offers and counter-offers. Subject pairs were then taken to separate rooms to negotiate and were told they had 30 minutes in which to come to agreement or face the no-agreement payoffs (a $90 loss with no market pressure or $120 loss with market pressure as shown in Appendix B, Panels A and B).

Once an agreement was reached, the experimenter verified the conditions of the agreement and the resulting profits accruing to each party. Subjects were then asked to complete an exit questionnaire to gather various demographic and control variable information. At the conclusion of the experiment, subjects were paid based on the profits or losses they earned on the agreement.

Subjects received an initial endowment of dollars at the beginning of the experiment ($7 under the no market pressure condition and $9 under the market pressure condition). Depending on their performance in the negotiation, subjects could increase or decrease this pool of dollars. The amount of money that negotiators could receive (or forfeit in the market pressure condition) was equal to 7 percent of the profits (losses) earned in the negotiation. The initial dollar amounts were calculated such that the total wealth of participants was approximately equal in both market conditions, after taking into account the profit or loss from the standard agreement. Subjects were informed that outcomes were likely to be closer to the standard agreement if they did not share their cost reports. Thus, subjects in the market pressure condition faced a choice between not sharing their report and earning approximately $8 ($9 − .07($15)) and sharing their report with the associated potential for gains and losses noted in Table 1. Similarly, subjects in the no market pressure condition faced a choice between not sharing their report and earning approximately $8 ($7 + .07($15)) and sharing their report with the associated outcomes. Thus, subjects in both the market pressure (loss) and no market pressure (gain) conditions chose between $8 with relative certainty (by not sharing) and an uncertain amount (by sharing). Based on standard expected utility theory without inequity-aversion considerations, the choice to share should be independent of the condition (market versus no market), since the absolute wealth associated with the outcomes is the same in both cases. The next section presents the results of the experiment.

IV. RESULTS AND DISCUSSION

Fifty-three negotiating pairs (106 students) consisting of M.B.A., master's, and upper-division undergraduate students enrolled at a midwestern university participated in the experiment. Each experimental session took approximately 60 to 75 minutes and negotiators were compensated based on the profits or losses they earned from their negotiated agreements. On average, negotiators were paid approximately $12.30 for participating.

Manipulation Checks

Following the initial instruction period and prior to the actual negotiation, subjects were asked to complete a questionnaire designed to assess the effectiveness of the experimental manipulations and to test subjects' understanding of the task and the potential for inequitable outcomes and the risk associated with sharing their cost reports. Subsequent analysis revealed that subjects in all conditions knew how to calculate their own costs and understood that they had the option of sharing their official cost report during the negotiation.

Table 3 contains the results of relevant manipulation checks. Panel A illustrates that subjects understood whether their cost report was in an ABC or VBC format. Panel B demonstrates that subjects believed that sharing their cost reports created the opportunity for their negotiating partners to take advantage of them (average of 6.1 out of 7), but note that opportunism expectations did not differ significantly between type of report (6.3 for ABC and 6.0 for VBC). Panel C shows that in general subjects considered sharing their cost reports as risky, as indicated by the average scores being significantly greater than 1 (i.e., not risky at all). In addition, those furnished with ABC reports perceived a slightly greater risk to sharing their reports than did subjects furnished with VBC reports. Panel D shows that subjects were correctly aware of whether they were under the presence or absence of market pressure.

H1: Efficiency Effects of Sharing

Hypothesis 1 is a benchmark prediction that negotiating pairs sharing their ABC cost reports will reach more efficient agreements than pairs that share VBC reports. In addition pairs sharing either ABC or VBC are expected to agree on more efficiencies than pairs that don't share reports. Table 4 shows the average percentage of the maximum possible cost reduction, relative to the standard agreement, that pairs received from their negotiated agreements. Recall that the standard agreement resulted in total costs of $260 across both negotiators. The optimal agreement would result in total costs of $220, so the maximum possible cost reduction is $40. The percentages listed in Table 4 are the agreed-upon cost efficiencies divided by the $40 maximum. Thus, if a pair reached the most efficient agreement, then they would be at 100 percent of optimal, whereas a pair that agreed to the standard agreement would be at 0 percent of optimal.[9]

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[9] Although it was possible for subjects to agree to outcomes that increased the joint costs above the cost level of the standard agreement ($260 as shown in Table 1), only one negotiating pair in the ABC and no market pressure condition and who did not share their cost reports increased their joint costs above $260 to $280.

TABLE 3
Manipulation Checks[a]

Manipulation Topic/Questions	Mean	Mean
Panel A: Understanding of Information Detail in ABC versus VBC Reports		
	ABC	**VBC**
Q: If I give my official cost report to the other negotiator, they will know what my labor and materials costs are (and what drives them) but *not* what drives my overhead costs (reverse scored). Q: If I give my official cost report to the other negotiator, they will know what determines *all* of my costs and what those cost amounts are.	11.8	3.3
	(F = 547.8, p < .001)	
Panel B: Belief that Opportunism Is a Consequence of Sharing		
	ABC	**VBC**
Q: If I give my Official Cost Report to the other negotiator, they may be able to use the information to increase their own profits at my expense.	6.3	6.0
	(F = 1.55, p <. 218)	
Panel C: Risk of Sharing Official Cost Report[b]		
	ABC	**VBC**
Q: Please rate how risky you feel it would be to share your Official Cost Report with the other negotiator (1 = not risky at all; 7 = very risky).	5.3	4.6
	(F = 8.7, p < .005)	
Panel D: Understanding of Market Pressure		
	Pressure	**No Pressure**
Q: If the other negotiator and I agree to exchange a standard casing at the standard price, I will lose money. Q: The industry in which the other negotiator and I operate in is currently facing strong competition that has driven prices below profitable levels.	12.5	3.5
	(F = 804.0, p < .001)	

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[a] Questions were measured on a seven-point Likert scale with 1 representing strongly disagree and 7 representing strongly agree. Responses to the two questions shown in Panels A and D were summed.

[b] Although the t-test shows the mean perceived risk is significantly different between the ABC and VBC conditions, perceived risk is not significant when used as a covariate in the efficiency test of hypotheses reported in the tables.

The marginal means displayed in Panel A of Table 4 show that on average, pairs that did not share cost reports reached agreements that were only 32 percent efficient. In contrast, pairs that shared cost reports reached agreements that were 82 percent efficient. On average, pairs that shared ABC reports reached agreements that were 92 percent efficient, while pairs that shared VBC reports reached agreements that were 76 percent efficient. It is also interesting to note that of the 11 pairs that shared ABC reports, 10 (91 percent) reached the optimal agreement. In contrast, only 10 out of 18 pairs (56 percent) that shared VBC reports reached the optimal agreement. Support for the interaction predicted in H1 is

TABLE 4
Average Percentage of Trade Efficiency Captured in Individual Agreements

Panel A: Summary Statistics[a]

	Pairs That Shared Cost Info.	Pairs That Did Not Share Cost Info.	Marginal Means
ABC	92% (.26) n = 11	21% (.34) n = 17	49% (.47) n = 28
VBC	76% (.36) n = 18	57% (.43) n = 7	71% (.38) n = 25
Marginal Means	82% (.33) n = 29	32% (.40) n = 24	Overall 59% (.44) n = 53

Panel B: ANOVA Results

Source	Sum of Squares	df.	Mean Square	F-statistic	Significance of F
Share	2.289	1	2.289	19.26	.000
Report	.109	1	.109	.916	.343
Share × Report	.782	1	.782	6.578	.013
Explained	4.118	3	1.373	11.55	.000
Error	5.824	49	.119		
Total	9.942	52			
Contrast Model	2.137	1	2.137	17.957	.0001-H1

[a] In Panel A, the dependent variable, percentage of trade efficiency, is calculated by dividing the cost savings realized in each individual agreement by the maximum possible cost savings of $40. The independent manipulated variables are cost report type (ABC versus VBC) and sharing versus not sharing cost reports. The cells contain the average percent of the maximum possible cost reduction (relative to the standard agreement) that pairs achieved, (standard deviation), and n = number of pairs per condition.

illustrated in the Table 4, Panel B ANOVA that shows a significant effect for sharing crossed with report type (F-statistic = 6.58; p-value < .013). Figure 2 shows the interaction.

However, H1 predicts a specific form of the interaction where efficiency for shared ABC reports is significantly higher than efficiency for shared VBC reports. In addition, report sharing is predicted to result in significantly more efficient outcomes than when negotiators do not share reports. The mean levels contained in Table 4 are consistent with this prediction. To test the significance of H1, a contrast coded model was applied. Contrast coding is a method used to test the significance of a specific pattern of means among a set of experimental conditions (Rosenthal et al. 2000; Buckless and Ravenscroft 1990; Rosenthal and Rosnow 1985). By specifying the pattern of means, a more powerful test is created that uses only one degree of freedom.[10] To apply a contrast model, the set of

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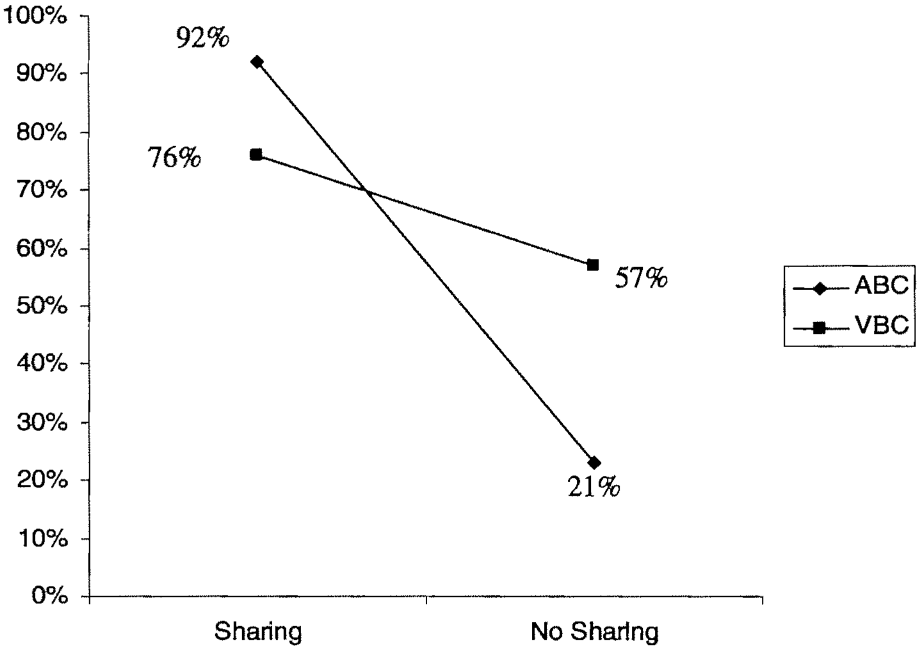
[10] Contrast coding tests for a specific ordering among a set of means, in contrast to "omnibus" F-tests that test for *any* differences among a set of means, regardless of order.

FIGURE 2
H1: Interaction Effect of Cost Report Type and Sharing on Efficiency



Vertical axis represents the percentage of available trade efficiencies captured.

experimental means is weighted by a corresponding set of contrast codes that matches the mean pattern to be tested while satisfying the restriction that the set of codes add up to zero. Hypothesis 1 predicts that the mean in the share/ABC condition is the highest, the mean in the share/VBC condition is the next highest, and the remaining means are significantly less than in the sharing conditions. The following contrast codes (in parentheses) were applied:[11]

(2) Share/ABC; (0) Share/VBC; (−1) No Share/ABC; (−1) No Share/VBC.

The results of testing the model are shown at the bottom of Panel B in Table 4 and provide strong support for H1 (F-statistic = 17.96; p-value < .001).[12]

H2, H3a, and H3b: Cost Report Type, Sharing Information, and Market Pressure

Based on inequity-aversion, strategic uncertainty, and risk-dominance ordering, H2 predicted that the proportion of pairs that share their cost reports is higher for the group with the option to share a less detailed (VBC) cost report than for the group with the option to share a more detailed (ABC) report. Panel A of Table 5 shows that of the 25 pairs with the option to share a VBC report, 18 (72 percent) chose to share their reports. In contrast, only 11 (39 percent) of the 28 pairs with the option to share an ABC report chose to share. The ANOVA results shown in Panel B of Table 5 reveal that this difference was significant (F-statistic = 7.29; p-value < .009). This significant main effect for cost report format, combined with a lack of a significant interaction term, provides support for H2.

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[11] Other sets of contrast weights that follow the basic pattern can also be used, as long as they sum to zero (e.g., 3, 1, −2, −2). The contrast weights applied (2, 0, −1, −1) provide a conservative test.

[12] The total explained sum of squares, degrees of freedom, and residual mean square from the standard ANOVA contained in Panel B of Table 4 are used to calculate the model sum of squares and F-statistic. Exact calculations can be found in Rosenthal and Rosnow (1985).

Hypothesis 3a predicts that the proportion of negotiating pairs that choose to share their official cost report is higher for the group facing losses from market pressures than for the group facing no market pressure and profitable conditions. Table 5, Panel A shows the percentage of pairs that chose to share their cost reports within the four experimental conditions. Of the 26 pairs randomly assigned to the market pressure condition, 19 (73 percent) chose to share their reports. In contrast, of the 27 pairs assigned to the profitable, no market pressure condition, only 10 (37 percent) chose to share.

Table 5, Panel B ANOVA results show the significance of differences in the percentage of pairs that shared cost reports across the experimental conditions.[13] The main effect of the market pressure condition was significant, yielding an F-statistic of 8.80 with a significance level less than .005. This result, combined with the lack of a significant interaction between the competitive market and cost report format conditions, provides support for H3a and is illustrated in Figure 3. The prospect of losses resulted in risk-seeking behavior where a significantly higher percentage of pairs explicitly shared their cost reports than did those with a prospect of profits.

Hypothesis 3b predicts that the effects of the market pressure condition and report type will combine in an additive manner such that negotiators facing losses and having VBC reports will share those reports with the greatest frequency, while negotiators facing profits and having ABC reports share with the lowest frequency. Panel A of Table 5 reveals results consistent with this prediction. The highest incidence of sharing occurred under the VBC/market pressure condition where 11 of the 12 pairs (92 percent) chose to share their reports. Under the ABC/no market pressure condition, only 3 of the 14 pairs (21 percent) chose to share.

To test the significance of H3b, a contrast coded model was applied in a fashion similar to that used for H1. To apply the contrast model, the set of experimental means were weighted by the corresponding set of contrast codes that match the mean pattern to be tested. Hypothesis 3B predicted that the percent-sharing mean is highest in the market pressure/VBC condition, lowest in the no market pressure/ABC condition, and the remaining means fall in the middle of these extremes. Thus, the following contrast codes (in parentheses) were applied:

(1) market pressure/VBC; (−1) no pressure/ABC; (0) market pressure/ABC;
(0) no pressure/VBC.

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[13] Even though the dependent variable for H2 and H3a is dichotomous (i.e., either shared or did not share) we present ANOVA results for the statistical analysis rather than logistic regression for two reasons. First, ANOVA F-statistics are robust despite departures from normality of the dependent variable (Kirk 1995; Keppel 1991; Lunney 1970) and choosing a lower significance level such as .025 or .01 is likely to correct for any distortion due to non-normality (Keppel 1991). The ANOVA results reported in the text satisfy these stricter significance criteria. Second, ANOVA results are relatively easier to interpret within an experimental context than that provided by logistic models. The results of the logistic regression model showed that both variables were significant (cost report: Wald statistic = 6.26, p < .012; market pressure condition: Wald statistic = 7.28, p < .007).

TABLE 5
Proportion of Pairs Sharing Reports

Panel A: Summary Statistics[a]

	Market Pressure	No Market Pressure	Marginal Means
ABC	57% [8/14] (.51) n = 14	21% [3/14] (.43) n = 14	39% [11/28] (.50) n = 28
VBC	92% [11/12] (.29) n = 12	54% [7/13] (.52) n = 13	72% [18/25] (.46) n = 25
Marginal means	73% [19/26] (.45) n = 26	37% [10/27] (.49) n = 27	

Panel B: ANOVA Results

Source	Sum of Squares	df.	Mean Square	F-statistic	Significance of F
Report	1.48	1	1.48	7.29	.009-H2
Pressure	1.78	1	1.78	8.80	.005-H3a
Report × Pressure	.001	1	.001	.01	.930
Explained	3.20	3	1.07	5.26	.003
Error	9.93	49	.20		
Total	13.13	52	.25		
Contrast Model	3.27	1	3.27	16.38	.0001-H3b

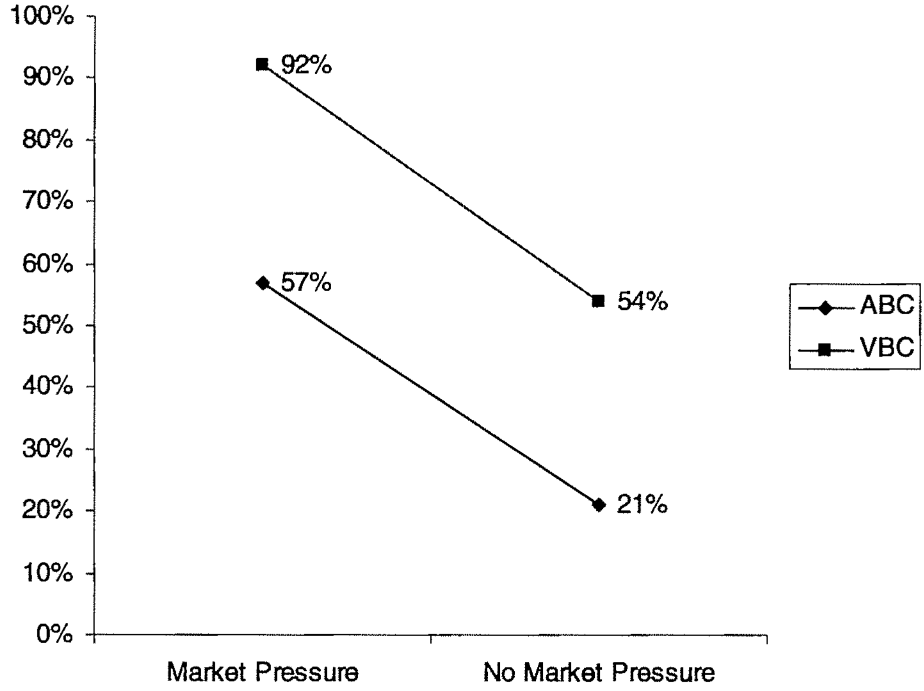
[a] In Panel A, the dependent variable is the percentage of pairs that shared cost information; the independent manipulated variables are cost report type (ABC versus VBC) and market conditions (market pressure versus no market pressure). Each cell contains the percentage of pairs that shared [number of pairs that shared/total pairs in condition], (standard deviation), and n = number of pairs per condition.

The results of testing the model are shown at the bottom of Panel B in Table 5 and provide strong support for H3b (F-statistic = 16.38; p-value < .0001).

Cost Type and Total Trade Efficiencies Captured: *Ex Post* Analysis

The impact of the tension between potential for gains from trade and the potential for opportunistic behavior by a negotiating partner can be evaluated in our study by considering how much of the total available efficiencies (shown in Figure 1) were captured by negotiators with each type of cost report. As an example of the potential market-wide consequences of the hold-up problem, suppose there are ten negotiating pairs with ABC information and ten pairs with VBC information. Suppose that two out of the ten pairs with ABC information share, while six out of the ten pairs with VBC information share. If all of the available efficiency gains revealed in the shared "official" cost information is realized, then the two ABC pairs will realize a total of $80 (2 × $40) in efficiency gain, while the six VBC pairs will realize a total of $120 in efficiency gain (6 × $20). Even though individual ABC agreements are more efficient when information is shared, the ABC market fares worse in terms of total efficiency gains than the VBC market because fewer pairs share.

FIGURE 3
H2 and H3a: Main Effects of Report Type and Market Pressure on Sharing



Vertical axis represents the percentage of pairs that shared cost reports.

Thus, although individual agreements are likely to be more efficient when information is shared, only a small portion of the overall market-wide available efficiencies to information sharing will be captured if very few negotiating pairs share information. The following analysis examines the impact of the inequity driven opportunism-efficiency tension inherent in bargaining with asymmetric information.[14] We examine the proportion of total available efficiencies captured by negotiators with VBC cost reports as compared to the proportion captured by negotiators with ABC cost reports.

This analysis informs us about the tension between the motivation to share cost information to create value and the risk dominance that motivates inequity-averse negotiators to avoid sharing detailed cost information. Table 6, Panel A provides the mean percentage of available efficiencies captured by negotiators in each condition. For example, 14 negotiating pairs with ABC cost reports facing market pressure negotiated over a total available efficiency of \$560 (14 pairs × \$40 per pair) and were able to capture \$385 of efficiencies or 68.8 percent. Notice that the lowest percent sharing and lowest capture of available efficiencies occurred in the no market pressure condition with ABC cost reports (29.5 percent

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[14] Results for this section are dependent on instrumental design choices. However, our analysis offers a conservative test of efficiency since negotiators in both conditions had complete private information about all of their own costs and drivers. Although VBC negotiators with official cost information are theoretically able to obtain the same efficiency level as ABC negotiators, without complete official information it is more challenging and costly.

TABLE 6
Proportion of Available Efficiency Captured

Panel A: Summary Statistics[a]

	Market Pressure	No Market Pressure	Marginal Means
ABC	$385 ÷ $560 = 68.75% [57%] (.39) n = 14	$165 ÷ $560 = 29.46% [21%] (.46) n = 14	49% (.46) n = 28
VBC	$325 ÷ $480 = 67.71% [92%] (.38) n = 12	$380 ÷ $520 = 73.08% [54%] (.39) n = 13	70% (.38) n = 25
Marginal means	68% (.38) n = 26	50% (.48) n = 27	

Panel B: ANOVA Results-All Pairs

Source	Sum of Squares	df.	Mean Square	F-statistic	Significance of F
Report	.598	1	.598	3.556	.065
Pressure	.380	1	.380	2.257	.139
Report × Pressure	.658	1	.658	3.912	.054
Explained	1.703	3	.568	3.376	.026
Error	8.239	49	.168		
Total	9.942	52			

[a] In Panel A, the independent manipulated variables are cost report type (ABC versus VBC) and market conditions (market pressure versus no market pressure). Cells contain the dependent variable equal to percent of total available efficiencies captured (i.e., total efficiencies captured/total available efficiencies), the percentage of pairs that shared [number of pairs that shared/total pairs in condition], (standard deviation), and n = number of pairs per condition.

of efficiencies and only 21 percent of pairs sharing). As shown in Panel B of Table 6, the main effect for type of report (ABC versus VBC) is significant ($p < .065$ two-tailed or $< .0325$ one-tailed).[15] The significant interaction of report and market pressure is shown in Figure 4 and clearly driven by the no market pressure, ABC report condition.

One surprising and interesting result shown in Table 6 and illustrated in Figure 4 is that for negotiators in the market pressure condition, those with VBC information were able to capture nearly the same level of efficiencies as those with ABC information. While this is partly an artifact of our experimental design, it does suggest that there are situations where VBC may be more efficient in a market-wide sense than ABC. The higher proportion of VBC negotiators who were willing to share information (92 percent versus 57 percent

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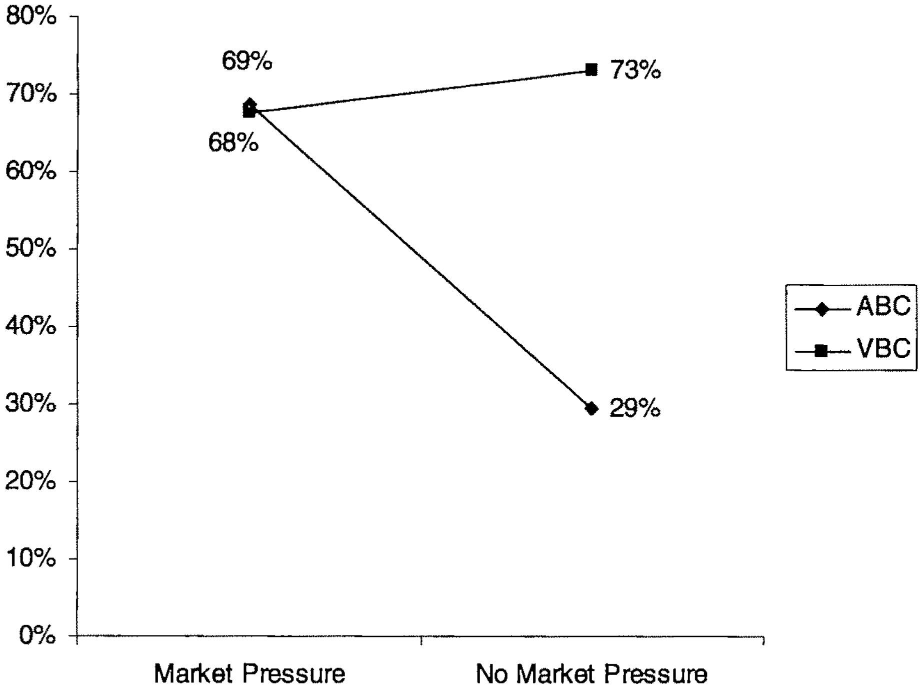
[15] Subject gender, degree program, grade point average, national origin, negotiation experience, and risk aversion were collected. Analyses showed no significant differences across the experimental conditions for grade point average, national origin, or risk aversion. However, gender, student type (M.B.A.), and negotiating experience differed across conditions. Using gender, M.B.A., and negotiating experience as separate covariate factors in testing the hypotheses failed to result in any significant effects.

FIGURE 4
Total Efficiencies Captured



Vertical axis represents the percentage of total available trade efficiencies captured in each experimental condition.

with ABC) explains their ability to capture available efficiencies. In addition, VBC negotiators were more willing to share information in the no market pressure setting (54 percent VBC sharing versus 21 percent ABC sharing). These results suggest that, particularly in profitable circumstances, aversion to inequity may dominate the potential for trade gains from sharing.

Supplemental Analyses

Supplemental analysis was used to assess two underlying assumptions, about inequity aversion and strategic uncertainty, and about the impact of experimental wording related to risk. Subjects were asked in a post-experiment question to assess the difference in payoffs between themselves and their negotiating partners. Table 7 results show that negotiators choosing not to share information were more likely to perceive inequitable outcomes. This is weak post-experimental support that inequity aversion was driving the choice not to share. However, even though prior to the negotiation, all subjects facing no market pressure believed strongly that they would not lose money if they exchanged a standard casing (mean = 1.94 out of a maximum of 7, no significant differences by information condition), subject responses to the question, "If I give my official cost report to the other negotiator, then they may be able to use the information to increase their own profits at my expense"

TABLE 7

Supplemental Evidence of Inequity Aversion: Perceived Differences in Payoff Outcomes

Panel A: Summary Statistics[a]

	Chose to Share	Chose Not to Share
ABC	4.68 (.839) n = 22	4.38 (.853) n = 34
VBC	4.61 (.688) n = 36	4.07 (1.439) n = 14

Panel B: ANOVA Results—All Subjects

Source	Sum of Squares	df.	Mean Square	F-statistic	Significance of F
Share	4.045	1	4.045	5.014	.027
Report	.837	1	.837	1.037	.311
Share × Report	.331	1	.331	.411	.523
Explained	4.176	3	1.392	1.725	.166
Error	82.286	102	.807		
Total	2215	106			

[a] In Panel A, the dependent variable was coded consistently with inequity aversion behavior; 5 when subject responses indicated their outcome is perceived equal to their partners, 4 when outcome is perceived to be a little more than partners, 3 when outcome is perceived to be a little less than partners, 2 when outcome is perceived to be much more than partners, and 1 when outcome is perceived to be much less than partners.

revealed significant differences between those who eventually chose to share and those who did not. Specifically, those who chose not to share responded significantly higher on this pre-negotiation question than those who did share ($t = 2.27$, $p = .03$). Thus, subjects who ended up not sharing cost information also exhibit a higher pre-negotiation belief in the potential for inequitable results.

Regarding strategic uncertainty about sharing behavior, while all subjects believed they had the option to share their cost reports (mean = 6.7 on seven-point scale), in the no market pressure condition VBC negotiators viewed sharing their cost information as only "somewhat risky" (mean = 4.31), while ABC negotiators viewed sharing as closer to very risky (mean = 5.5, $p < .0006$, based on the question in Panel C of Table 3). These results are consistent with ABC negotiators believing there is more strategic uncertainty from sharing their information than VBC negotiators.

The experimental scripts instructed subjects that sharing the finer ABC information was relatively more risky than sharing coarser VBC information.[16] In order to make sure this experimental wording was not driving the results, we assessed whether perceived risk affected the efficiencies from sharing information as reported in Tables 4 and 6. Subjects' responses to a pre-negotiation question asking how risky they thought it was to share their official cost report with the other negotiator (see Panel C of Table 3) were used as a covariate. This risk covariate was not significant for Table 4, ($F = .085$, $p < .77$) or Table

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[16] Detailed scripts are available from the first author.

6, ($F = .079$, $p < .78$).[17] Alternatively, Table 5 sharing results were motivated by prospect theory arguments, suggesting that risk is an important consideration. In this case, the risk covariance analysis was consistent with this motivation ($F = 4.932$, $p < .031$). Importantly, independent variable effects in all tables remain highly significant after controlling for the risk covariate. To further allay concerns that sharing results were driven by experimental wording related to risk, additional data was collected on 21 pairs (under no market pressure) where references to risk were removed from the experimental materials. Results were consistent with the results reported for the original experimental materials. The percentages of pairs sharing the two types of cost reports was similar to those reported in Table 5 (i.e., 50 percent shared under VBC; 27 percent shared under ABC). Both ANOVA and logistic regression analysis showed no significant differences in sharing between the data reported in the text and the newly collected data for either of the cost report types.

V. CONCLUSIONS

Surveys indicate that although numerous firms in the U.S. are attempting to establish better buyer-supplier relations, progress and satisfaction vary widely (Henke 2006; Edelman 1997; Ellram 1995; Richardson 1993). A high level of information exchange has been habitually cited as a critical factor determining the quality and success of buyer-supplier partnerships (Ellram 1995; Richardson 1993). However, buyers and suppliers have repeatedly demonstrated an aversion to sharing information. We show that the degree of information fineness or detail is a critical factor in the choice to share information in small numbers bargaining settings like a buyer-supplier negotiation.

Incomplete contracting models identify bargaining as a mechanism that helps resolve potential investment hold-ups between buyers and suppliers (e.g., Baiman and Rajan 2002a, 2002b; Gul 2001; Edlin and Reichelstein 1996). Baiman and Rajan (2002b) point to the value of accounting information when bargaining and hold-ups are present. However, in most cases, as noted by Baiman and Rajan (2002b, 232) these models assume information is symmetric. In addition, these models ignore utility effects associated with relative comparisons among negotiating partner's outcomes. Our results suggest contracting approaches may be enriched by including additional utility considerations that represent social preference outcomes in combination with asymmetric information.

We show that concerns about inequity, paired with strategic uncertainty and risk dominance, motivate a failure to share detailed accounting information and can result in less efficient outcomes between buyers and suppliers. Because fewer negotiators choose to share detailed information, overall market efficiencies are reduced. Our results suggest that firms with highly refined cost systems may not realize some gains available from buyer-supplier transactions due to the reluctance of managers to share the information necessary for interfirm cost minimization. Efforts to encourage information sharing may be necessary, particularly during profitable periods. In fact, some firms have created enforcement rules to ensure information sharing. Honda and Toyota, for example, have created official policies that motivate cooperative relations and information sharing with their key suppliers (MacDuffie and Helper 1997).

Other researchers suggest that in cases where risk-dominance equilibrium selection occurs, institutional arrangements may arise to alleviate coordination failures. Anctil et al. (2004) investigated the effect of information transparency among creditors and found that increased transparency resulted in multiple equilibria and increased strategic uncertainty resulting in risk-dominant equilibrium selection. They suggested that institutional arrangements among creditors, such as a bank pool that shares information when credit distress occurs, may be designed to eliminate problems of strategic uncertainty (Anctil et al. 2004, 185). In a buyer/supplier setting, similar institutional arrangements can be observed that may be designed to provide information that reduces strategic uncertainty. For example, in the auto industry a widely publicized annual survey of suppliers provides information on the quality of supplier relationships with large auto manufacturers (Henke 2006). The reported supplier relationship quality is influenced by the opportunistic versus cooperative behavior exhibited by auto manufacturers (Sherefkin 2007). The publication of the survey results may help mitigate the strategic uncertainty suppliers face when negotiating with particular automobile manufacturers by providing a signal of what type of behavior to expect. Future research can investigate how these types of institutional arrangements affect negotiated outcomes.

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[17] Alternatively, Table 5 sharing results were motivated by prospect theory arguments suggesting that risk is an important consideration. In this case, the risk covariance analysis was consistent with this motivation ($F = 4.932$, $p < .031$).

We also show that negotiators facing losses brought on by competitive market pressures are more willing to share cost information than negotiators facing profitable conditions. Our market pressure results suggest that adverse conditions present an opportunity for firms to break out of confrontational or competitive interactions with customers and suppliers. The presence of an external market pressure induces greater information sharing and problem solving across both ABC and VBC cost report types and results in capturing efficiencies across a wider portion of the value chain.

Finally, we successfully model the effect of opportunistic behavior by using an inequity aversion model. Other theories of fairness and reciprocity exist (e.g., Bolton and Ockenfels 2000; Charness and Rabin 2002; Cox et al. 2006) and may be useful in modeling opportunistic behavior. However intention-based reciprocity models are far more complex than outcome-based theories like inequity aversion (see Sobel [2005] for a survey of this literature). In addition, we chose inequity aversion due to its tractability, but more importantly because it has been shown to be consistent with the outcomes of many different experimental games (Fehr et al. 2007).

The experimental nature of this study creates several limitations. Only a limited number of factors can be examined concurrently. Other factors, such as the relative power of the negotiators, the size of the transaction and past negotiation history, future negotiations probabilities, etc., have been shown to impact negotiated outcomes but were not manipulated here. In addition, the experimental setting is by necessity simplified and the results cannot be generalized to richer contexts without additional research.

Further research could determine the sensitivity of the results to experimental parameters included in the current study. For example, in our setting the magnitude of the potential gains and losses relative to the reference point are equal. It is more likely that unequal potential gains and losses occur. In this study, both buyers and suppliers had the option to share the same type of cost report, either aggregated or disaggregated. However, one firm may possess disaggregated cost information, while the other firm has aggregated information. An interesting question is how sharing behavior is affected when one party is unable to reciprocate in an equivalent manner.

Negotiators are impacted by the inherently mixed-motive nature of buyer-supplier interactions. Incentives are designed to motivate negotiating managers to capture the maximum share of possible trade efficiencies. However, total trade efficiencies may be increased if negotiators engage in joint problem solving. Accounting typically plays a role in both the incentive to capture trade efficiencies and the incentive to engage in joint problem solving during buyer-supplier interactions. Research can help untangle the delicate interplay between the need to share information to create productive efficiencies and the reluctance to provide information that can be used for opportunistic behavior.

APPENDIX A
SUPPLIER'S OFFICIAL COST REPORTS

(Note: **Standard casing costs are in bold** and *replace #4 with shaded items in italics for ABC.*)

	VBC	ABC
1. Materials Costs—Base		
$5 if base is made of Tin		
$15 if base is made of Plastic		
$25 if base is made of Steel		
Standard casing base is made of Plastic	**$15**	**$15**
2. Materials Costs—Blocks		
$5 if casing blocks are Red		
$25 if casing blocks are Yellow		
$45 if casing blocks are Blue		
Standard casing blocks are Yellow	**$25**	**$25**
3. Labor Costs		
$5 if casings are Unassembled		
$25 if casings are Partially assembled		
$45 if casings are Fully assembled		
Standard casings are Partially assembled	**$25**	**$25**
4. Overhead Costs	**$65**	**NA**
Standard Casing: Total Cost	**$130**	
4. Setup Costs		
$5 if casings are made of Large blocks		
$20 if casings are made of Medium blocks		
$35 if casings are made of Small blocks		
Standard casings are made of Medium blocks	***NA***	***$20***
5. Supervision Costs		
$5 if casings are made in Three weeks		
$25 if casings are made in Two weeks		
$45 if casings are made in One week		
Standard casings are made in Two weeks	***NA***	***$25***
6. Handling Costs		
$5 if casings are Unbagged		
$20 if casings are Single-bagged		
$35 if casings are Double-bagged		
Standard casings are Single-bagged	***NA***	***$20***
Standard Casing: Total Cost		**$130**

APPENDIX B
PROFIT/LOSS CALCULATION SHEET

Panel A: Casing Buyer

	Proposals	Final Agreement
Sales Revenue (Selling Price)		
Casing Costs (Purchase Price) (Standard Casing price: $145)		
Materials Costs: $35 if casing blocks are Red or **$20 if casing blocks are Yellow** or $5 if casing blocks are Blue (Standard casings are yellow)		
Labor Costs—Assembly $35 if casing are Unassembled or **$20 if casings are Partially assembled** or $5 if casings are Fully assembled (Standard casings are partially assembled)		
Labor Costs—Chip Installation $45 if casing base is Tin or **$25 if casing base is Plastic** or $5 if casing base is Steel (Standard casing bases are plastic)		
Overhead—Storage Costs $25 if casings are made in Three weeks or **$15 if casings are made in Two weeks** or $5 if casings are made in One week (Standard casings are made in two weeks)		
Overhead—Inspection Costs $45 if casings are Unbagged or **$25 if casings are Single-bagged** or $5 if casings are Double-bagged (Standard casings are single-bagged)		
Overhead—Testing Costs $45 if casings are made of Large blocks or **$25 if casings are made of Medium blocks** $5 if casings are made of Small blocks (Standard casings are made of medium blks)		
Overall Profit/Loss		

Additional Information:
The final product sells for a fixed price of $230 (market pressure)/$290 (no market pressure).
Standard Casing selling price (based on past purchases): $115 ($145 no market pressure).

If you can't come to agreement:
You will earn a loss of $120 ($90 no market pressure) and the manager of Alpha will earn a loss of $120 ($90 no market pressure).

Panel B: Casing Supplier

	Proposals	**Final Agreement**
Sales Revenue (Selling Price)		
Materials Costs—Base $5 if base is made of Tin or **$15 if base is made of Plastic** or $25 if base is made of Steel (Standard casing base is made of plastic)		
Materials Costs—Blocks $5 if casing blocks are Red or **$25 if casing blocks are Yellow** or $45 if casing blocks are Blue (Standard casing blocks are yellow)		
Labor Costs $5 if casings are Unassembled or **$25 if casings are Partially assembled** or $45 if casings are Fully assembled (Standard casings are partially assembled)		
Overhead Costs—Setup $5 if made of Large blocks or **$20 if made of Medium blocks** or $35 if made of Small blocks (Standard casings use medium blocks)		
Overhead Costs—Supervision $5 if made in Three weeks or **$25 if made in Two weeks** or $45 if made in One week (Standard casings are made in two weeks)		
Overhead Costs—Handling $5 if casings are Unbagged or **$20 if casings are Single-bagged** or $35 if casings are Double-bagged (Standard casings are single-bagged)		
Overall Profit/Loss		

Additional Information:
Buyer's final product sells for a fixed price of $230 (market pressure)/$290 (no market pressure).
Standard Casing selling price (based on past sales): $115 (pressure)/$145 (no pressure).

If you can't come to agreement:
You will earn a loss of $120 (pressure)/$90 (no pressure).
The manager of Beta will earn a loss of $120 (pressure)/$90 (no pressure).

APPENDIX C
ANALYSIS OF THE OFF-DIAGONAL CELLS RESULTING IN RISK DOMINANCE IN THE ABC SETTING[18]

Basic assumptions:

1) Negotiators will not take profits lower than those available from the standard agreement.
2) "a" is the portion of total available efficiency gains (total available is 40) captured by the more knowledgeable negotiator and a is strictly greater than 20. Then 40 − a = b < 20, where "b" is the efficiency gain captured by the less knowledgeable negotiator. Thus, in the lower left (**LL**) cell, buyer (seller) is more (less) knowledgeable and in the upper right (**UR**) cell, seller (buyer) is more (less) knowledgeable.
3) When buyer chooses not to share and supplier chooses to share (LL), then buyer captures a larger portion of the available trade efficiencies than supplier, that is b < a. Notice if a = 20, then an equal split occurs resulting in the outcomes in the upper left (UL) cell.
4) Using the inequity function, $U_i(x) = x_i - \alpha_i \max\{x_j - x_i, 0\} - \beta_i \max\{x_i - x_j, 0\}$, where $\beta_i \leq \alpha_i$, $0 \leq \beta_i < 1$, and i = b (buyer) or s (seller), we created the following table:

Supplier **Buyer**	**Share**	**Do Not Share**
Share:	UL	UR
Dollars	(35, 35)	[(15 + b), (15 + a)]
Utils	**(35, 35)**	**$[(15 + b - \alpha_b(a - b)), (15 + a - \beta_s(a - b))]$**
Do Not Share:	LL	LR
Dollars	[(15 + a), (15 + b)]	(15, 15)
Utils	**$[(15 + a - \beta_b(a - b)), (15 + b - \alpha_s(a - b))]$**	**(15, 15)**

Risk dominance implies decision makers will minimize the opportunity cost incurred by a unilateral move off of an equilibrium cell. The two equilibrium cells are **UL** and **LR**. In the **UL** cell assume buyer chooses not to share and supplier chooses to share thus moving to the **LL** cell. In the **LL** cell: $20 < a \leq 40$ and $0 \leq \beta < 1$ implies that $(15 + a) - \beta_b(a - b) \geq 35$ whenever $\beta \leq .5$. Thus, there are no opportunity costs for buyers with $\beta \leq .5$. However, when $\beta > .5$ and the more knowledgeable party captures 50 percent or more of the available trade efficiencies, then opportunity costs arise. Fehr and Schmidt (1999, 844) identify general values for α_i and β_i where $\beta_i = 0$, .25, and .6 for 30 percent, 30 percent, and 40 percent of the population, respectively. This suggests that for 60 percent of the population, there would be no opportunity costs of moving from **UL** to **LL**.

Consider the **LR** cell and assume buyer chooses to share when seller continues to choose not to share, thus moving to the **UR** cell. Fehr and Schmidt (1999) show general values for $\alpha_i = 0$, .5, 1, and 4 for 30 percent, 30 percent, 30 percent, and 10 percent of the population, respectively. If α_i = .5, 1, or 4, unless the supplier offers to share at least 1/4, 1/3, or 4/9 of the trade efficiency ($10, $13.33, $17.77), respectively, then the buyer incurs opportunity costs. Thus, in the lower right cell, 70 percent of the population incurs opportunity costs. The point is that in the face of strategic uncertainty about what the supplier might choose to do, a significant percentage of the buyers would choose the do not share equilibrium, rather than the share equilibrium, as a means to minimize their opportunity costs.

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[18] Contact the first author for a complete table of the risk dominance computations related to the experimental setting.

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Long-Run Corporate Tax Avoidance

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ABSTRACT: We develop and describe a new measure of long-run corporate tax avoidance that is based on the ability to pay a low amount of cash taxes per dollar of pre-tax earnings over long time periods. We label this measure the "long-run cash effective tax rate." We use the long-run cash effective tax rate to examine (1) the extent to which some firms are able to avoid taxes over periods as long as ten years, and (2) how predictive one-year tax rates are for long-run tax avoidance. In our sample of 2,077 firms, we find there is considerable cross-sectional variation in tax avoidance. For example, approximately one-fourth of our sample firms are able to maintain long-run cash effective tax rates below 20 percent, compared to a sample mean tax rate of approximately 30 percent. We also find that annual cash effective tax rates are not very good predictors of long-run cash effective tax rates and, thus, are not accurate proxies for long-run tax avoidance. While there is some evidence of persistence in annual cash effective tax rates, the persistence is asymmetric. Low annual cash effective tax rates are more persistent than are high annual cash effective tax rates. An initial examination of characteristics of firms successful at keeping their cash effective tax rates low over long periods shows that they are well spread across industries but with some clustering.

Keywords: *effective tax rate; tax persistence; cash tax; long-run tax avoidance.*

Data Availability: *Data used in this study are available from public sources identified in the paper.*

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I. INTRODUCTION

We develop and describe a new measure of corporate long-run tax avoidance. We use this measure to investigate (1) the extent to which some firms are able to avoid taxes over periods as long as ten years, and (2) how predictive one-year tax rates are for tax avoidance in the long run. We measure tax avoidance as the ability to pay a low amount of cash income taxes (as opposed to GAAP tax expense that one would find on a firm's income statement) relative to corporate pre-tax earnings. We are interested in firms' global tax avoidance, i.e., the combined effects of income taxes in all jurisdictions in which the firm does business. Accordingly, we compute our cash effective tax rate measure as the ratio of cash taxes paid across all jurisdictions (domestic, foreign, and state and local) to the firm's worldwide pretax book income. We measure the cash effective tax rate for firms over periods ranging from one to ten years—with the ten-year measure being the sum of cash taxes paid over ten years divided by the sum of pretax book income over those same ten years. We refer to the ten-year rate as the "long-run cash effective tax rate.[1]

It is important to emphasize that tax avoidance does not necessarily imply that firms are engaging in anything improper. There are numerous provisions in the tax code that allow and/or encourage firms to reduce their taxes. In addition, in practice there are many areas in which the law is unclear, particularly for complex transactions, and firms may take positions on their returns in which the ultimate tax outcome is uncertain. For purposes of this study, we define tax avoidance broadly as anything that reduces the firm's cash effective tax rate over a long time period, i.e., ten years.[2] Thus, our measure will reflect both tax reductions that are squarely in compliance with the law as well as those that result from gray-area interpretations.[3]

Our paper is descriptive in nature as we examine the properties of this new measure, assess whether long-run tax avoidance occurs, and investigate whether a measure commonly used in research, the annual effective tax rate, is predictive of our long-run tax avoidance measure. We do not test specific hypotheses about firms' propensities to avoid taxes, leaving that for future research. Rather, we attempt to improve upon the measurement of tax avoidance, specifically in the long run, and evaluate whether firms can indeed avoid taxes over a long period of time.

Our examination of long-run cash effective tax rates reveals that during the period 1995–2004 the mean (median) ten-year cash effective tax rate is 29.6 percent (28.3 percent). We are most interested in those firms that are able to hold their cash effective tax rates well below the mean and median. We find that 546 publicly traded firms, representing approximately 26.3 percent of our sample, have a ten-year cash effective tax rate at or below 20 percent during the period 1995–2004.[4] Moreover, 9.2 percent of the sample is able to maintain a ten-year cash effective tax rate at or below 10 percent.[5] This evidence suggests that there is a sizeable subset of firms that are able to avoid corporate income taxes over long periods of time.

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[1] We consider five-year time periods as a long-run measure as well. The annual rates are considered short-run rates.

[2] While no measure of tax avoidance is perfect, an important advantage of the long-run perspective is to allow time for uncertain tax positions to be audited and challenged by the IRS. We discuss this point further below.

[3] We use the term "avoidance" rather than tax sheltering, tax evasion, or tax aggressiveness because we do not intend to imply any wrongdoing on the part of the firm, but rather that the firm is able to avoid paying taxes on the income it reports to shareholders over a long period of time through all means.

[4] We define "low" and "high" rates below. However, generally for low-rate firms we include those firms with a rate of 20 percent or less and for high-rate firms we include firms with a rate of greater than 40 percent. We do not intend to imply that there is a "normal" rate that firms should be paying, but rather we just include firms at the ends of the distributions as either low or high.

[5] The top U.S. statutory rate was constant during this ten-year period at 35 percent. We mention this only as a point of reference for the reader.

We examine annual cash effective tax rates to investigate to what extent they persist and, thus, how useful they are at reflecting long-run tax avoidance. We find that on average the annual rates exhibit some persistence over time, but that the persistence is asymmetric. Low annual effective tax rates are more persistent than are high annual effective tax rates. Despite evidence of persistence in annual effective tax rates, there is considerable variation in them both across firms and across time. The data reveal that annual effective tax rates are not very good predictors of long-run effective tax rates and thus, are not accurate proxies for long-run tax avoidance. Finally, firms with low long-run effective tax rates come from a variety of industries, though there is some clustering in certain industries, e.g., petroleum and natural gas.[6]

Corporate tax avoidance has received much attention throughout the last 25 years. For example, evidence of corporate tax avoidance led to the Tax Reform Act of 1986, the largest overhaul of the U.S. tax code in history. More recently, a number of commentators have perceived a resurgence in corporate tax avoidance activities (e.g., Bankman 2004). Researchers have employed a number of approaches to shed light on tax avoidance, including examining book-tax differences for the aggregate corporate sector (U.S. Department of the Treasury 1999), in publicly traded firms (Plesko 2000; Manzon and Plesko 2002; Desai 2003; Yin 2003; Hanlon and Shevlin 2005; Hanlon et al. 2005) and using tabulated tax return data (Mills et al. 2002; Plesko 2002; Plesko 2004). What is common to these prior studies is that they focus on annual measures of avoidance. Thus, we do not know if the same firms are avoiding taxes year after year or whether tax avoidance is a transitory phenomena based on a particular set of circumstances (e.g., divesting a line of business in a tax-favored manner). Using a long-run measure of tax avoidance we are able to examine whether firms are able to avoid taxes over a longer period of time.

We believe our measure will be useful to several groups. Tax researchers can use our measure (or perhaps slight variations depending on the research question) to address a number of questions. For example, Frischmann et al. (2007) use our measure to test whether firms with low effective tax rates have more adverse market reactions surrounding events related to changes in accounting rules for tax contingencies than firms with high effective tax rates. Blouin and Tuna (2006) use our measure to investigate whether another variable (i.e., the estimate of the tax contingency reserve) is associated with tax avoidance. In addition, Ayers, Jiang, and Laplante (2007) and Ayers, Laplante, and McGuire (2007) use our measure to classify firms as high tax planning firms when investigating taxable income as a performance measure and when examining whether book-tax differences are associated with credit rating changes.

Financial accounting researchers and people who teach financial statement analysis may be interested to know the extent of cross-sectional variation that exists in long-run tax avoidance. This same group also may find it noteworthy that annual effective tax rates appear to vary greatly but have only modest ability to predict long-run avoidance. There appears to be demand for information about the effective tax rate for firm valuation and financial statement analysis. For example, Swenson (1999) conjectures that the stock market views low-tax firms as better at controlling costs than their high-tax counterparts. In addition, Lev and Thiagarajan (1993) and Abarbanell and Bushee (1997) both include a measure of the effective tax rate as a fundamental signal in trying to predict future earnings changes.

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[6] Oil and gas firms are the beneficiaries of tax incentives designed to encourage oil exploration and production. Conversely, oil and gas firms may face political pressure during times of high oil prices that could cause them to forgo tax-planning opportunities and at times has subjected them to additional taxes (e.g., the Windfall Profits Tax of the 1970s). Because our sample period is mainly one of low oil prices we do not predict high political costs for oil and gas firms, in line with Watts and Zimmerman's (1986) observation that political costs vary with economic conditions.

Policymakers may find the results useful in appreciating the extent of variation that exists across firms in cash effective tax rates even when measured over a ten-year period. Policymakers may also find the measure useful when determining whether a particular industry or type of firm should have more or fewer tax breaks.[7]

The paper proceeds as follows. Section II discusses prior related research. Section III describes our measure of tax avoidance in detail and discusses the differences between our measure and effective tax rate measures from firms' financial statements. Section IV provides a description of our sample, tests, and results. Section V concludes.

II. RELATED RESEARCH

There are two lines of research that are highly relevant for this paper. The first consists of studies that examine variation in annual effective tax rates.[8] The second investigates the causes and consequences of book-tax differences.[9]

There is a long line of research that examines variation in annual effective tax rates and examines the factors associated with effective tax rates (see Callihan [1994] and Shackelford and Shevlin [2001] for summaries). For example, Zimmerman (1983) examines firm size (as a component/proxy for a firm's political cost) and the association with effective tax rates. Zimmerman (1983) reports that firm size is positively associated with a firm's effective tax rate consistent with the political cost hypothesis (see also Gupta and Newberry 1997). Other studies have also included an examination of firm size and annual effective tax rate measures. The evidence from these studies is mixed, i.e., some studies observe a negative relation (e.g., Siegfried 1974; Porcano 1986), others report a positive relation (e.g., Rego 2003), and still others no association (e.g., Stickney and McGee 1982; Shevlin and Porter 1992; Gupta and Newberry 1997). In other work, Mills et al. (1998) examine firms' investments in tax planning and as part of their analyses they investigate the returns to firms' investments in terms of effects on the firm's effective tax rate.

There has also been politically motivated research on corporate effective tax rates. For example, the Citizens for Tax Justice (CTJ) published a series of studies that provide a good example of how effective tax rates have been used in tax policy debates. Based on effective tax rate calculations, in each of their studies, the CTJ claims that the largest U.S. corporations are not paying their fair share of taxes. The CTJ studies are widely believed to have influenced many of the sweeping changes in the Tax Reform Act of 1986, arguably the largest corporate tax reform in U.S. history. The CTJ studies use annual effective tax rates and three-year average effective tax rates, but only for U.S. taxes and only for around 250 firms per study.

None of these studies have examined long-run effective tax rates nor have they utilized cash taxes paid rather than the firm's tax expense reported on the firm's income statement. While it may be possible for firms to avoid taxes in the short run, it is not clear if firms are able to avoid taxes over the long run.

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[7] Companies may also be interested in this measure as a way of benchmarking to their peers. Evidence exists that firms compete in terms of tax rates. For example, in a *Forbes* article on tax sheltering a shelter promoter revealed that "A potential client once said that he would hire the firm if we could get his tax rate down, because it was higher than their competitors' and they were embarrassed" (Novack and Saunders 1998).

[8] See Rego (2003), Mills et al. (1998), Collins and Shackelford (1995), Gupta and Newberry (1997), Shevlin and Porter (1992), Wilkie (1988), Dhaliwal et al. (1992), and others (see Callihan [1994] for a review).

[9] See Hanlon (2005), Mills (1998), Guenther et al. (1997), Manzon and Plesko (2002), and others.

The second line of research that is related to our paper is the extensive literature on book-tax differences. Firms successful at long-run tax avoidance are likely, though not necessarily, also firms that are able to sustain large differences between GAAP income and taxable income. Book-tax differences and tax avoidance are not exactly the same because tax avoidance can take place in many forms, including generating tax credits and shifting income to low-tax jurisdictions. Nevertheless, we expect an association between tax avoidance and book-tax differences.[10]

Just as we are aware of no prior study of long-run tax avoidance, we are aware of no study of long-run book-tax differences. There have been a number of studies that investigate causes and consequences of book-tax differences (for example, Manzon and Plesko 2002). Other studies use the unexplained portion of the book-tax difference as a measure of potential tax sheltering (Desai and Dharmapala 2007). Finally, Frank et al. (2006) use an estimate of a firm's permanent differences as a measure of tax-reporting aggressiveness in their investigation of whether firms are simultaneously aggressive for tax reporting and financial reporting. All of these studies use annual measures of book-tax differences.

In addition, several recent papers provide evidence that book-tax differences contain information about financial accounting earnings quality (i.e., earnings management) and not just tax aggressiveness (see Mills and Newberry 2001; Phillips et al. 2003; Hanlon 2005; Badertscher et al. 2006). Moreover, accounting textbooks and recent studies also investigate the potential link between book-tax differences and firm value (e.g., Revsine et al. 1999; Hanlon 2005; Lev and Nissim 2004). Again, however, none of these studies focus on long-run measures. It is to this task that we now turn.

III. MEASURING LONG-RUN TAX AVOIDANCE

Problems with Annual GAAP Effective Tax Rates

To understand how we measure long-run tax avoidance it is useful to first consider the annual GAAP effective tax rate and what it does and does not capture. The GAAP effective tax rate, which firms are required to disclose in the notes to their financial statements, is the ratio of total tax expense to pretax income. Thus, the GAAP effective tax rate for a given firm i for year t ($GAAP\ ETR_{it}$) is given by:

$$GAAP\ ETR_{it} = \frac{Tax\ expense_{it}}{Pretax\ income_{it}}. \tag{1}$$

The first problem with the *GAAP ETR* as a measure of tax avoidance is that it is based on only annual data. There can be significant year-to-year variation in annual effective tax rates, as well as undefined effective tax rates due to negative denominators, that can obscure inferences about a firm's tax avoidance. Second, under SFAS No. 109, *Accounting for Income Taxes*, tax expense is composed of the sum of current tax expense and deferred tax expense. Deferred taxes represent taxes that will be paid (or refunded) in the future as a result of the reversal of temporary book-tax differences. A great deal of tax avoidance involves accelerating deductions and deferring income for tax purposes relative to book purposes, which reduces current taxes but increases deferred taxes. Because *GAAP ETRs* include both current and deferred taxes, they will not reflect such forms of tax avoidance.

Using current tax expense in the numerator (rather than total tax expense) can also present challenges. For example, during our sample period, firms were often able to take tax deductions when employees exercised stock options but, under then-prevailing GAAP, recognized no expense at grant date or exercise date—a permanent difference. Under GAAP the tax benefits for the deduction were added directly to equity rather than reducing current tax expense. As a result, current tax expense was overstated relative to the taxes actually paid for firms with stock option deductions. Additional problems occur because of book accruals within the tax expense such as the valuation allowance and the tax contingency reserve (or tax cushion).[11] All of these issues cause problems in measuring the taxes actually owed/paid by the firm and thus, problems measuring the extent of a firm's tax avoidance.[12]

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[10] Indeed, Mills (1998) reports evidence consistent with large book-tax differences being associated with more Internal Revenue Service (IRS) audits and audit adjustments.

Measuring the Long-Run Cash Effective Tax Rate

To overcome the limitations of *GAAP ETRs*, we make two key modifications. First, and most importantly, we measure effective tax rates over long time periods, i.e., ten years. To do this, we sum a firm's total cash taxes paid over a ten-year period and divide that by the sum of its total pretax income (excluding the effects of special items) over the same ten-year period.[13] This produces an effective tax rate that more closely tracks the firm's tax costs over the long run.[14] This is not the same as simply averaging a series of single-year effective tax rates—averaging would tend to overweight the effects of years with unusually large or small (even negative) effective tax rates.

The second improvement is that we measure effective taxes using cash taxes paid rather than GAAP tax expense. For example, cash effective tax rates take into account the tax benefits of employee stock options, whereas GAAP effective tax rates (using total tax expense or only current tax expense) do not. Moreover, unlike GAAP effective tax rates, cash effective tax rates are not affected by changes in estimate such as the valuation allowance or tax cushion. Cash tax paid can be found in the financial statements as a supplemental disclosure at the bottom of the statement of cash flows or in the notes to the financial statements.

We vary the measurement period, N, from one year to as long as ten years. Our resulting cash effective tax rate for firm i measured over the period $t = 1$ to N ($CASH\ ETR_i$) is:

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[11] Under SFAS No. 109, firms are required to record a reserve (valuation allowance) against a deferred tax asset if it is more likely than not that they will not realize the some or all of the benefits of the deferred tax asset in the future. The tax cushion, or tax contingency reserve, is used when firms need to record a reserve for the potential future costs associated with a tax position being overturned. Recent evidence suggests that management can manipulate earnings through these accounts (Gleason and Mills 2002; Miller and Skinner 1998; Schrand and Wong 2003; Dhaliwal et al. 2004).

[12] See Hanlon (2003) for additional discussion of issues related to measurement of taxes owed/paid by the firm.

[13] Cash tax paid is data item 317 in Compustat. Special items (data item 17) include a variety of items, for example restructuring charges, severance pay, any significant nonrecurring item, goodwill impairments, inventory write-downs when in a separate line item or specifically called nonrecurring, litigation reserves, nonrecurring gains and losses on the sale of assets, securities, and investments, charges related to floods, fire, and other natural disasters. Write-downs of goodwill and other assets are GAAP-only items that have no effect on taxes. We exclude special items because they can be quite large and introduce volatility in one-year ETR measure relative to long-run ETR measures. For more detail on special items see McVay (2006), Burgstahler et al. (2002), and Dechow and Ge (2006).

[14] Like other effective tax rate measures that divide by a measure of GAAP income, the denominator of our long-run effective tax rate measure is subject to well-known limitations of GAAP income. For example, the denominator could be affected by activities designed to manage pretax income but that have no effect on taxes paid, such as management of certain book-only accruals. By measuring effective tax rates over long-periods, our measure should be less affected by accruals management activities than are annual effective tax rate measures because our long time period should capture the reversals of the accruals.

$$CASH\ ETR_i = \frac{\sum_{t=1}^{N} Cash\ Tax\ Paid_{it}}{\sum_{t=1}^{N} (Pretax\ Income_{it} - Special\ Items_{it})}. \tag{2}$$

We recognize that cash taxes paid over short time periods is an imperfect measure of avoidance because it includes payments to (and refunds from) the IRS and other tax authorities upon settling of tax disputes that arose years ago. When measured over long time periods, however, the income to which these taxes relate will more likely be included in the same ratio as the taxes. This reinforces the importance of looking over long horizons when measuring successful tax avoidance, as we illustrate in the next section.

IV. EMPIRICAL EVIDENCE

Sample Selection

We impose minimal requirements on our sample in order to maximize our coverage. We require firms to be covered by Compustat, incorporated in the U.S. (*FINC* = 0), with ten consecutive years of non-missing cash taxes paid (data317), income tax expense (data16), and pretax income (data170) during the years 1995–2004.[15,16] Imposing these requirements results in a sample of 24,390 firm-years, corresponding to 2,439 unique firms that have an unbroken string of cash taxes paid, income tax expense, and pretax income.

Most of our tests require firms to have positive pretax income when summed over the ten-year period. This requirement reduces the sample to 2,077 firms. We focus on these 2,077 firms to improve comparability across effective tax rate measures (so we are not changing both the measure and the sample), and to enhance interpretation of the effective tax rate measure (an effective tax rate with a positive denominator).

The Distribution of Cash Effective Tax Rates

Table 1 presents distributional characteristics of *CASH ETRs*, each measured over periods ranging from one year to ten years for a sample of all Compustat firm-years with non-missing *CASH ETR* data over the ten years studied. *CASH ETR1* refers to a *CASH ETR* (as given by Equation (2)) measured over a one-year period. *CASH ETR5* and *CASH ETR10* refer to the *CASH ETR* but measured over five-year and ten-year periods, respectively.

Examination of the 2,439 unique firms that have available data yields the surprising finding that the percentage of firms with negative pretax income does not drop much as the aggregation period increases. For example, 17.78 percent of firm-years in this sample (4,337/24,390) have negative denominators, while 14.84 percent of the ten-year measures (362/2,439) have a negative denominator (i.e., aggregate ten-year pretax earnings). In unreported tests we find that the 362 firms with negative aggregate ten-year earnings are predominantly small firms.

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[15] To eliminate noncorporate firms, we delete firms with SIC code of 6798 (Real Estate Investment Trusts), and firms with names ending in "-LP" containing "TRUST" and firms with six-digit CUSIPs ending in "Y" or "Z."

[16] We impose the U.S incorporation criterion for simplicity but acknowledge that the distinction between U.S. firms and foreign firms becomes increasingly complicated as firms can be incorporated in one country but have their headquarters and their stock traded in another. Thus, this screen excludes firms such as Carnival Corp. and Tyco Intl. Ltd., both of which trade on the NYSE and have their operational headquarters in the U.S. but which are incorporated in Panama and Bermuda, respectively.

TABLE 1
Distributional Characteristics of *CASH ETRs* at Different Horizons

	CASH ETR1	*CASH ETR5*	*CASH ETR10*
Panel A: Observations			
Unique Firms	2,439	2,439	2,439
Firm Observations	24,390	4,878	2,439
Firm Observations with Denominator > 0	20,054	4,085	2,077
Panel B: Percent of Observations with Non-Meaningful Interpretations			
%Observations with Denominator <= 0	17.78%	16.26%	14.84%
%Observations outside [0,1], excluding Denominator <= 0	7.58%	4.68%	3.08%
Panel C: Distributional Characteristics			
Mean	0.270	0.291	0.296
Std. Dev.	0.212	0.189	0.176
5th Pctl	0.000	0.029	0.066
25th Pctl	0.114	0.180	0.195
Median	0.256	0.277	0.283
75th Pctl	0.366	0.359	0.350
95th Pctl	0.672	0.630	0.621

CASH ETR1, *CASH ETR5*, *CASH ETR10* are calculated by summing cash tax paid (data317) over one, five, and ten years, respectively, and dividing by pretax income excluding special items (data170–data17) summed over one, five, and ten years, respectively. The sample for Panel C excludes observations with a negative or zero denominator. Variables are winsorized at zero and one.

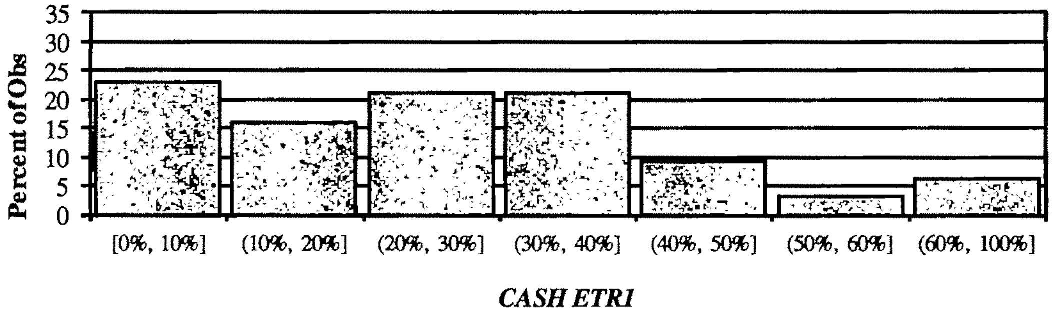
Even when pretax income is positive, non-meaningful *CASH ETRs* can arise when taxes paid are negative (causing a negative *CASH ETR*) or are so high as to exceed pretax income (causing a *CASH ETR* greater than 100 percent). The frequency of *CASH ETRs* that fall outside the band from zero to one range from 7.58 percent for *CASH ETR1* to 3.08 percent for *CASH ETR10*. In order to make the *CASH ETRs* more interpretable, we winsorize the values at 0 and 1.

Panel C in Table 1 examines the distribution of *CASH ETRs*. The table reveals that there is significant variation around the mean and median effective tax rates. At the 5th percentile *CASH ETR1* is zero and at the 25th percentile, *CASH ETR1* is only 11.4 percent. Such low effective tax rates are not as easy to sustain for longer time periods. *CASH ETR10* at the 5th percentile is 6.6 percent and at the 25th percentile it is 19.5 percent. However, it does appear that some firms are successful at tax avoidance even over relatively long periods of time.

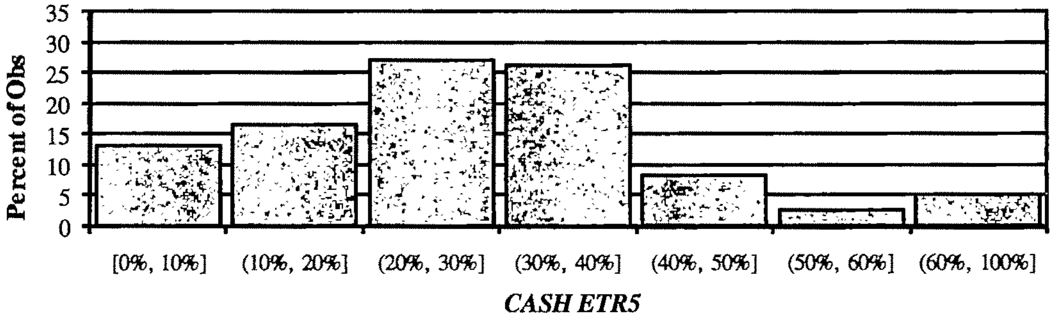
Figure 1 presents histograms of *CASH ETRs* over one-, five-, and ten-year measurement periods for firms with positive denominators. To construct the histograms, we divide the sample into seven groups—firms with *CASH ETRs* less than 10 percent, firms with *CASH ETRs* between 10 percent and 20 percent, and so on up to firms with *CASH ETRs* greater than 60 percent. The sample from which we obtain the observations for each panel is the set of 2,077 firms that have positive denominators (i.e., positive pretax income) for the

FIGURE 1
Histograms of *CASH ETR* at Various Aggregation Horizons

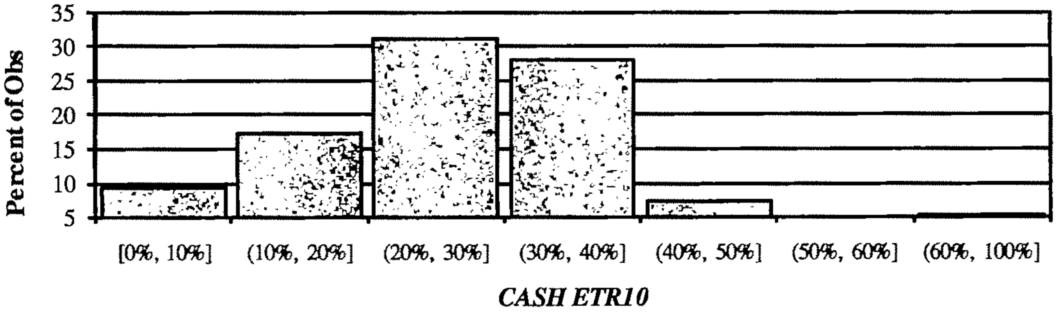
Panel A: Distribution of *CASH ETR1* (n = 20,054)



Panel B: Distribution of *CASH ETR5* (n = 4,085)



Panel C: Distribution of *CASH ETR10* (n = 2,077)



CASH ETR1, *CASH ETR5*, *CASH ETR10* are calculated by summing cash tax paid (data317) over one, five, and ten years, respectively, and dividing by pretax income excluding special items (data170–data17) summed over one, five, and ten years, respectively. The number of observations in each panel reflects the total number of firm-observations with meaningful *CASH ETR*s for each aggregation horizon as reported in the third row of Panel A in Table 1.

CASH ETR10 measure.[17] It is clear when looking down the figure that the distribution of

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[17] Even though this sample (the 2,077 firms) includes only firms with positive pretax income for *CASH ETR10*, the shorter interval measures *CASH ETR1* and *CASH ETR5* contain some negative denominators, which have to be excluded for the separate analysis of these measures. For example, the *N* for *CASH ETR1* is 20,054 rather than 20,770 (2,077 × 10) because 716 (approximately 3.4 percent) of the *CASH ETR1* observations have negative denominators, even after requiring that the *CASH ETR10* denominator be positive.

CASH ETRs tightens as the measurement period increases. With a one-year measurement period, *CASH ETRs* are fairly evenly spread across tax rate categories ranging from 0 to 40 percent. Only about 21 percent of the sample has *CASH ETR1s* between 30 percent and 40 percent and approximately 23 percent of the sample has a rate between 0 and 10 percent. With a ten-year measurement period, slightly more than 28 percent of the sample has *CASH ETR10s* between 30 percent and 40 percent, while only 9 percent of the sample has a long-run rate between 0 and 10 percent. Thus, it is more difficult to maintain a low tax rate as one lengthens the time period.

For the remainder of the paper, we classify firms as "low" tax rate firms if their *CASH ETR10* is less than or equal to 20 percent. We classify firms as "high" if their *CASH ETR10* is greater than 40 percent. We note that while the proportion of *long-run* rates that are low is smaller than the proportion of *annual* rates that are low, the proportion of long-run rates that are low is greater than the proportion of long-run rates that are high. For example, much more of the sample has a low long-run tax rate (≤20 percent; 26 percent of the sample) than has a high long-run tax rate (>40 percent; 14 percent of the sample). Thus, there appears to be an asymmetry in *CASH ETR10s* even after restricting the sample to those with positive cumulative earnings over the ten-year period.[18]

One-Year Tax Rates: Persistence and Reliability as a Measure of Long-Run Avoidance

We have several objectives with this section: (1) to investigate the association of *CASH ETR1* with *CASH ETR10*, (2) to examine the frequency with which the use of annual cash effective tax rates results in misclassification of firms' long-run tax avoidance, (3) to investigate the extent to which *CASH ETR1* persists over time, and (4) to examine whether the persistence varies based on whether the one-year rate is relatively high or relatively low.

To examine the association of *CASH ETR1* with their long-run counterparts we regress *CASH ETR10* on *CASH ETR1*. We present the results in Table 2. The first row presents

TABLE 2
Association of *CASH ETR1* and *CASH ETR10*

Dependent Variable	Condition	Intercept	*CASH ETR1*	Adj. R^2	n
CASH ETR10	All Observations	0.206***	0.299***	0.146	1,891
CASH ETR10	*CASH ETR1* <= 0.2	0.195***	0.366***	0.019	712
CASH ETR10	0.2 < *CASH ETR1* <= 0.4	0.199***	0.337***	0.027	810
CASH ETR10	0.4 < *CASH ETR1*	0.251***	0.221***	0.064	369

***, **, * Statistical difference from 0 at the 1 percent, 5 percent, and 10 percent levels, respectively, using a two-tailed test.

This table examines the association of *CASH ETR1* with *CASH ETR10*. Randomly chosen *CASH ETR1s* that have negative denominators are excluded from these tests, resulting 1,891 observations. *CASH ETRs* are winsorized at 0 and 1.

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[18] As stated above, we acknowledge that this may not only be due to consistent aggressive tax planning or intentional tax avoidance but anything that reduces taxes paid per dollar of income reported to shareholders. For example in the early part of our sample period, part of this relatively greater persistence for the low-tax rate firms could be due to the stock option deduction year after year. In addition, firms that generate net operating losses (NOLs) are allowed to carryover the NOLs to the future, which will increase the persistence of the low rate even though their taxable income was more volatile.

the results for the entire sample. The data reveal a coefficient on *CASH ETR1* of 0.299 (p-value < .01) indicating a positive association between the one-year rates and the long-run measure. However, the coefficient is also significantly different from one (p-value < 0.01) suggesting that, while associated to some degree, *CASH ETR1s* are not good predictors of long-run cash effective tax rates. The remaining rows partition the sample based on *CASH ETR1*. Thus, the second row examines the relation of *CASH ETR1* and *CASH ETR10* for observations where a low (less than or equal to 20 percent) *CASH ETR1* is observed. For this subsample, the slope on *CASH ETR1* is 0.366 (also significantly different from both 0 and 1). The coefficient on *CASH ETR1* for firms whose *CASH ETR1* is in the 20–40 percent range is 0.337 and when the *CASH ETR1* is greater than 40 percent the slope drops to 0.221. These data are consistent with relatively high values of *CASH ETR1* being less associated with long-run cash effective tax rates than a *CASH ETR1* which is in the range of 20–40 percent. These data are also consistent with a low *CASH ETR1* being more highly associated with the long-run cash effective tax rate than a high *CASH ETR1*.

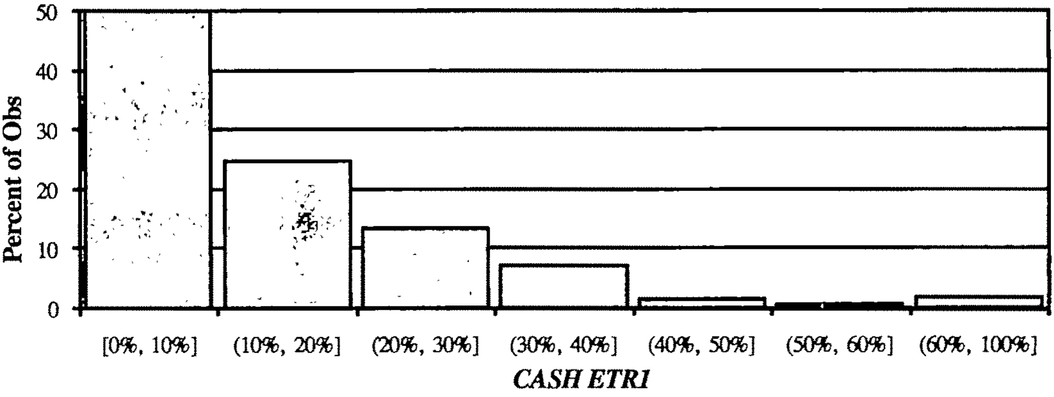
In Figure 2 we graphically examine the relation between one-year and ten-year cash effective tax rates to see how often a firm would be misclassified by using the annual cash effective tax rate rather than the long-run cash effective tax rate. To do this, we randomly select one meaningful (i.e., positive denominator) *CASH ETR1* for each firm. In Panel A we examine the distribution of the randomly selected *CASH ETR1s* for the 546 firms with *CASH ETR10* less than or equal to 20 percent. For these firms, the figure shows that 50 percent of the randomly selected *CASH ETR1* observations are between 0 and 10 percent and 74.7 percent are between 0 and 20 percent. Thus, many of the randomly selected *CASH ETR1s* would correctly identify a firm as a tax-avoider when in fact the firm is a tax-avoider over the long run. However, the fact that 25.3 percent of observations have a randomly selected annual rate greater than 20 percent means that using *CASH ETR1* observations would result in the misclassification of successful avoider firms as non-avoider firms 25.3 percent of the time.

Panel B of Figure 2 is similar to Panel A, but includes only firms with *CASH ETR10* > 40 percent. This panel shows that firms with high *CASH ETR10s* have *CASH ETR1s* (i.e., one randomly selected rate per firm) that are essentially evenly distributed over the range of possible values. Thus, the misclassification of firms would be even greater for high long-run cash effective tax rate firms. For example, if one draws a *CASH ETR1* from the set of firms with high long-run cash effective tax rate (rate > 40 percent) the annual rate would fail to indicate that the firm is a high tax-rate firm in 62 percent of the cases.

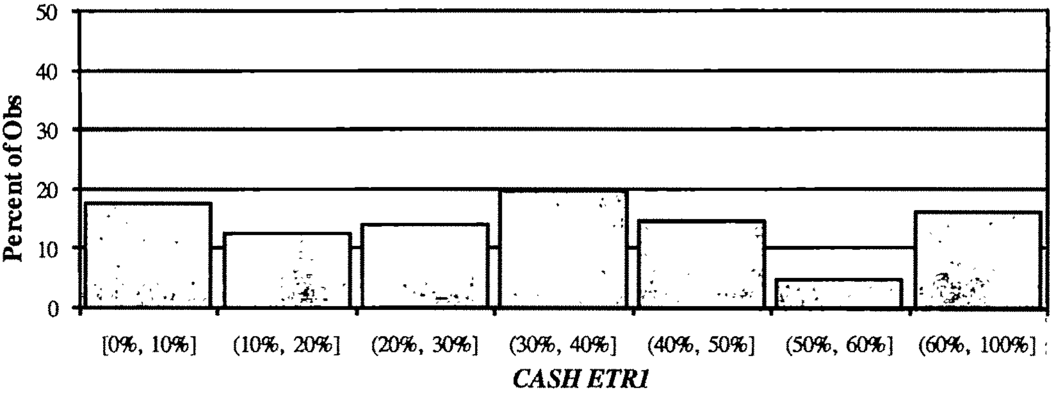
We next investigate the extent to which one-year cash effective tax rates persist over time and whether the persistence varies based on whether the one-year rate is relatively high or relatively low. We first do this using regression analysis. We regress one-year ahead *CASH ETR1* on the current year *CASH ETR1* for the full sample and then separately for the subsamples of observations where the current *CASH ETR1* is (1) less than or equal to 20 percent, (2) between 20 percent and 40 percent, and (3) greater than 40 percent. If annual cash effective tax rates were perfectly persistent, we would observe slope coefficients of 1 and intercepts of 0. Conversely, if annual cash effective tax rates were completely mean-reverting, such that each was an independent draw from a distribution with a given mean, then the slope coefficient would be zero and the intercept would equal the mean effective tax rate. The results in Table 3 indicate that *CASH ETR1* exhibits some persistence. For example, in the full sample of observations we find that the coefficient on the current year *CASH ETR1* variable is 0.315 and statistically different from 0 at a p-value of less than 0.01. For the subsample of observations where the current year *CASH ETR1* is low (at or below 20 percent) the coefficient on the current year *CASH ETR1* is 0.707 (which is

FIGURE 2
Relations between One-Year and Ten-Year *CASH ETR*s

Panel A: *CASH ETR1* for Firms with *CASH ETR10* [0%, 20%] (n = 546)



Panel B: *CASH ETR1* for Firms with *CASH ETR10* (40%, 100%] (n = 307)



CASH ETR1, *CASH ETR5*, *CASH ETR10* are calculated by summing cash tax paid (data317) over one, five, and ten years, respectively, and dividing by pretax income excluding special items (data170–data17) summed over one, five, and ten years, respectively. To achieve one-to-one correspondence between *CASH ETR1* and *CASH ETR10*, one meaningful *CASH ETR1* observation for each firm is randomly chosen from among each firm's set of meaningful *CASH ETR1* observations.

significantly different from both 0 and 1 at a p-value of less than 0.01). For observations with a current year *CASH ETR1* between 20 percent and 40 percent the coefficient on *CASH ETR1*$_t$ is 0.499 (also significantly different from both 0 and 1 at a p-value of less than 0.01) and for firms with a high *CASH ETR1* the coefficient is −0.010, which is not significantly different from 0. Thus, it does appear that overall there is persistence in *CASH ETR1*. However, the persistence varies depending upon whether *CASH ETR1* is low or high. If *CASH ETR1* is low, it has much greater persistence than if *CASH ETR1* is high.

We further examine the persistence of *CASH ETR1* by graphing annual cash effective tax rates and we present these data in Figure 3. We start with the sample of *CASH ETR1s* with denominators greater than zero (n = 20,054 as listed in Table 1). We then restrict this

TABLE 3
Persistence of *CASH ETR1* by Groups Based on *CASH ETR1*

Dependent Variable	**Condition**	**Intercept**	***CASH ETR1***	**Adj. R^2**	**n**
$CASH\ ETR1_{t+1}$	All observations	0.191***	0.315***	0.096	15,904
$CASH\ ETR1_{t+1}$	$CASH\ ETR1_t <= 0.2$	0.128***	0.707***	0.060	5,621
$CASH\ ETR1_{t+1}$	$0.2 < CASH\ ETR1_t <= 0.4$	0.164***	0.499***	0.026	7,268
$CASH\ ETR1_{t+1}$	$0.4 < CASH\ ETR1_t$	0.363***	−0.010	0.000	3,015

***, **, * Statistical difference from 0 at the 1 percent, 5 percent, and 10 percent levels, respectively, using a two-tailed test.

This table assesses the persistence of *CASH ETR1* for one-period-ahead *CASH ETR1* and how this persistence varies with the size of the *CASH ETR1*. *CASH ETR1s* that have negative denominators are excluded from these tests. *CASH ETRs* are winsorized at 0 and 1. Because we exclude observations with negative denominators in the *CASH ETR*1 for year *t* or *t*+1 and because the regression requires two years of data the sample size is smaller than the full sample of 20,054.

sample to firm-years between 1995–2000 so that we have four future years for each observation (n = 12,467). We then take the sample of firm-years that have *CASH ETR1* between 0 and 10 percent (n = 2,398). This group of firm-years is reflected in Figure 3, Panel A for the tax group [0 percent–10 percent] and Year 0 (i.e., the tallest bar in the graph). We then examine the distribution of the next four years' annual *CASH ETRs* for those firms after having a *CASH ETR1* between 0 and 10 percent. In Year 1, the data reveal that approximately 53 percent of those firms have a *CASH ETR1* again that is in the lowest 10 percent. In Years 2, 3, and 4, roughly 45 percent of the sample remains in the [0–10 percent] grouping.

For comparison purposes, we create a similar graph (Panel B of Figure 3) of firm-years with a *CASH ETR1* greater than 40 percent from the same initial sample described above. The data reveal that the high tax rates are much less persistent. For example, in Year 1 only 37 percent of the sample remains in the tax grouping where it started. By Year 4, only approximately 24 percent of the sample remains in the highest tax group. Thus, consistent with our regression analysis above, it appears that there is persistence in annual tax rates. However, low tax rates appear to be much more persistent than high tax rates.

Cash Effective Tax Rates across Industries

To examine whether the low rates we observe are strictly a function of industry membership, we examine the *CASH ETR10* measure by industry. We find there is considerable variation in long-run cash effective tax rates across industries, with cash effective tax rates ranging from as low as 19 percent to as high as 37.2 percent. We present these data in Table 4 by showing the average *CASH ETR10* for each industry, following the Fama and French 30 industry classification system.[19] The industry with the lowest cash effective tax rate is petroleum and natural gas, with an average *CASH ETR10* of 19 percent. Other low-tax industries are transportation (*CASH ETR10* = 21.0 percent), and aircraft, ships and equipment (*CASH ETR10* = 22.1 percent). The two industries with the highest average *CASH ETR10* are apparel at 35.5 percent and printing and publishing at 37.2 percent.

Table 4 also reports the percentage of the overall sample and the percentage of the low-tax (*CASH ETR10* ≤ 20 percent) firms that come from each of the various industries. Petroleum and natural gas, for example, constitutes 3.2 percent of the overall sample of

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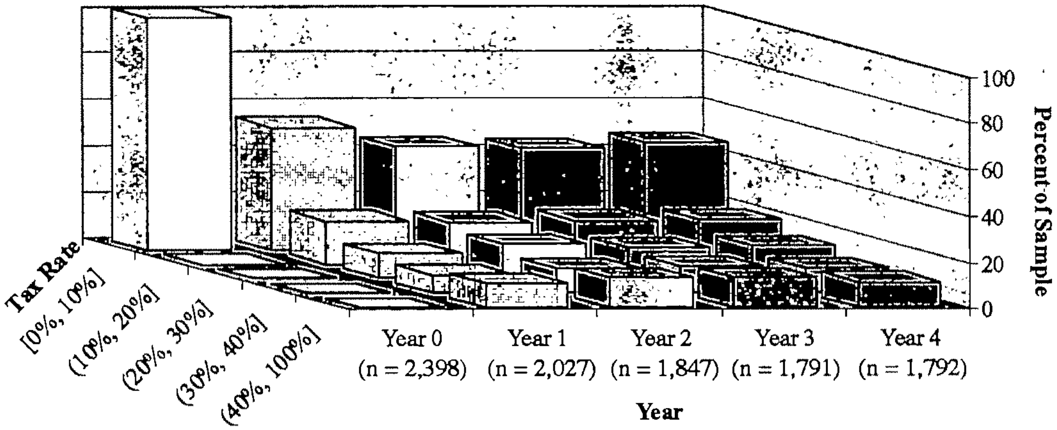
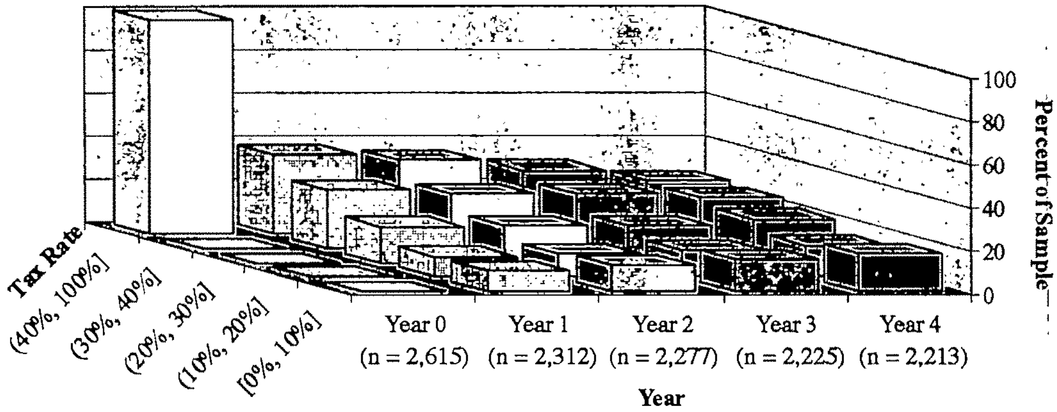
[19] Industry definitions are available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/.

FIGURE 3
Persistence of High and Low *CASH ETR1*

Panel A: Persistence of Low *CASH ETR1*



Panel B: Persistence of High *CASH ETR1*



CASH ETR1 is cash tax paid (data317) divided by pretax income excluding special items (data170–data17). The sample in Year 0 is derived from the 20,054 firm-years with positive denominators reported in Table 1. The sample is further reduced to firm-years between 1995 and 2000 so as to allow for four future observations (12,067 firm years). The number of observations varies by year in the panels because some firm-years have a positive denominator in Year 0, but a negative denominator in one or more of Years 1 to 4.

firms but 7.7 percent of the low-tax firms. Thus, these firms are more than twice as likely as the mean firm to have a low ten-year cash long-run effective tax rate. In short, there is some evidence of industry clustering of long-run tax avoiders. However, there is also plenty of firm-specific variation. Specifically, 44.5 percent of long-run tax avoiders come from industries that have an average *CASH ETR10* that exceeds the overall mean *CASH ETR10* of 29.6 percent.[20]

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[20] Because there is some industry clustering, researchers who go on to use this measure to examine the determinants of tax avoidance may want to consider using an industry-adjusted long-run cash effective tax rate.

TABLE 4
***CASH ETR10* by Industry**

Industry	n	*CASH ETR10*	Percent of Sample	Percent of Low Tax
Petroleum and Natural Gas	66	0.190	3.18	7.69
Transportation	62	0.210	2.99	5.86
Aircraft, Ships and Equipment	20	0.221	0.96	1.28
Steel Works	34	0.254	1.64	1.83
Recreation	39	0.256	1.88	2.93
Business Equipment	240	0.281	11.56	17.40
Financial Institutions	189	0.287	9.10	9.16
Food Products	49	0.288	2.36	2.56
Retail	144	0.291	6.93	4.21
Business Supplies and Shipping Containers	45	0.295	2.17	2.56
Chemicals	49	0.297	2.36	2.01
Utilities	191	0.301	9.20	8.06
Healthcare, Medical Equip and Pharmaceuticals	131	0.304	6.31	5.13
Other	83	0.304	4.00	4.21
Personal and Business Services	193	0.306	9.29	9.34
Fabricated Products	93	0.314	4.48	2.56
Construction and Const. Materials	77	0.315	3.71	1.83
Restaurants, Hotels, and Motels	38	0.315	1.83	1.10
Electrical Equipment	42	0.321	2.02	0.92
Communications	36	0.324	1.73	2.01
Consumer Goods	41	0.333	1.97	0.92
Wholesale	93	0.335	4.48	3.11
Automobiles	45	0.345	2.17	1.65
Apparel	44	0.355	2.12	1.47
Printing and Publishing	33	0.372	1.59	0.18

CASH ETR10 is defined in Table 1. Industries are the Fama-French 30 industries. Definitions are available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/. If an industry has fewer than 20 valid observations for *CASH ETR10*, then the firms in that industry are placed into an industry labeled "Other." The industry mean is the cross-section average of firm specific *CASH ETR10* observations within an industry. Observations with negative denominators are excluded. All tax rates are winsorized at 0 and 1.

Individual Firms with Low Cash Effective Tax Rates

To get a better sense of the types of firms successful at maintaining low long-run effective tax rates, we sort firms by market value as of the end of 2004 and then rank the largest 100 firms by *CASH ETR10*. Table 5 reports data for the 25 firms from this group of 100 with the lowest *CASH ETR10s*. We suppress the firm names and report these by industry membership only. For some of these firms the source of the low *CASH ETR10* can be discerned from examining their SEC filings and from knowledge of the tax laws.[21]

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[21] However, we note that for many firms why the cash tax rate is low or high is undeterminable because the disclosures of book-tax differences are limited and because there is no reconciliation between GAAP expense and cash taxes paid. Thus, we cannot, even by hand-collecting, explain for sure *why* each of the firms in our sample has either a high or low cash effective tax rate.

TABLE 5
25 Lowest *CASH ETR10* Firms among the Largest 100 Firms
(ranked by market value in 2004)

Company	*CASH ETR10*
Financial Institution Firm #1	0.036
Communication Firm #1	0.073
Financial Institution Firm #2	0.080
Aircraft, Ships and Equipment Firm #1	0.081
Business Equipment Firm #1	0.082
Business Equipment Firm #2	0.096
Other Firm #1	0.102
Recreation Firm #1	0.103
Aircraft, Ships and Equipment Firm #2	0.110
Business Equipment Firm #3	0.111
Healthcare, Medical Equip and Pharmaceuticals Firm #1	0.116
Communication Firm #2	0.120
Utilities Firm #1	0.124
Petroleum and Natural Gas Firm #1	0.128
Automobiles Firm #1	0.132
Personal and Business Services Firm #1	0.140
Healthcare, Medical Equip and Pharmaceuticals Firm #2	0.143
Financial Institution Firm #3	0.154
Personal and Business Services Firm #2	0.159
Healthcare, Medical Equip and Pharmaceuticals Firm #3	0.162
Business Equipment Firm #4	0.164
Healthcare, Medical Equip and Pharmaceuticals Firm #4	0.164
Healthcare, Medical Equip and Pharmaceuticals Firm #5	0.173
Financial Institution Firm #4	0.185
Healthcare, Medical Equip and Pharmaceuticals Firm #6	0.187

CASH ETR10 is defined in Table 1. This table reports the 25 lowest *CASH ETR10s* from among the 100 highest market value firms at the end of the 2004 fiscal year. Industries are the Fama-French 30 industries. Industry definitions are available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/.

We note that our sample selection criteria exclude foreign incorporated firms even when they have their operational headquarters in the U.S. and trade on a U.S. exchange. Had we included such firms in our sample, both Carnival Corporate and Tyco Intl. Ltd. would have made the Table 5 list of the firms with the lowest long-run cash effective tax rates. Among large corporations Carnival is a leader in maintaining a low tax rate, with a *CASH ETR10* of 0.7 percent.[22] Tyco also achieves tax savings from being incorporated in a tax haven, in its case Bermuda. Tyco is not able to avoid taxes to the extent of Carnival, however, with a *CASH ETR10* of 12.2 percent.[23]

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[22] Carnival is headquartered in Miami but is incorporated in Panama. Under Section 883 of the Internal Revenue Code, income derived by a foreign corporation from the international operation of ships or aircraft is, under certain conditions, excluded from U.S. taxation. Because it is incorporated in Panama, Carnival is considered a foreign corporation for this purpose. Not all of Carnival's income is exempt under Section 883. For example, in FYE 2004 Carnival reported approximately $1.9 billion of pretax income and approximately $8 million of cash tax paid.

All of the firms that make the list have a *CASH ETR10* lower than 20 percent. Surprisingly, only one of 25 firms is from the petroleum and natural gas industry, the industry that had the lowest average *CASH ETR10*.[24] Pharmaceutical firms are most heavily represented on the list of the 25 lowest tax firms, with six firms making the cut. These firms likely benefit from tax credits for engaging in research and development. There have also been assertions that pharmaceutical companies are adept at shifting income to low-tax jurisdictions by transferring intellectual property (e.g., patents) there and charging royalties to affiliates in high tax countries (Almond and Sullivan 2004).

The firms on this list illustrate that there are many potential causes of a low cash effective tax rate. A cluster of companies in the Business Services industry are likely on the list at least in part due to heavy use of employee stock options during this period. Because employee stock options were generally not expensed for financial reporting purposes during this period but did generate tax deductions, they tend to reduce *CASH ETRs*.[25]

Provisions designed to encourage research and development and to encourage exports also account for some low tax rates. For example, Aircraft, Shipping and Equipment Firm #1 appears to have experienced tax savings due to a combination of factors, including tax credits for engaging in research and development, charitable contributions, and export-friendly provisions that Congress enacted (i.e., the Foreign Sales Corporation [FSC] and Extraterritorial Income Exclusion Act [ETI]), which have since been repealed under pressure due to perceived conflicts with the General Agreement on Tariffs and Trade [GATT]).

Financial Institution Firm #1, an insurance company, has investments that generate large amounts of tax-exempt interest income as well as dividend income from other companies, which is subject to the dividends received deduction. In sum, an examination of individual companies shows there are many paths to low long-run cash effective tax rates. Some of these paths may be firm-specific and idiosyncratic, while others are due to industry membership or other factors. We leave a more detailed examination of the determinants of long-run cash effective tax rates to future research.

Descriptive Data on Long-Run Tax Avoiders and High Long-Run Tax Payers

In Table 6 we present some basic descriptive data about some of the characteristics of the firms in our sample by tax group—for the long-run tax avoiders (Low), the firms with a *CASH ETR10* between 20 and 40 percent (Mid) and firms with a *CASH ETR10* greater

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[23] The tax advantage of being incorporated outside the U.S. is two-fold. First, it removes foreign income from the U.S. tax system. U.S.-incorporated multinationals eventually face U.S. tax on their worldwide income and have to rely on foreign tax credits to mitigate double-taxation. Companies with income in low-tax foreign countries find that particularly onerous, as the U.S. approach to taxation results in foreign earnings being taxed at the greater of the foreign rate and the U.S. rate. By incorporating in a tax haven, firms avoid having to subject their foreign income to U.S. corporate income taxes. Second, some have alleged that firms incorporated in tax havens are able to shift income from high-tax jurisdictions to low- or no-tax jurisdictions through transfer pricing, intercompany debt, and transfers of intangible assets. These issues are discussed in detail by Desai and Hines (2002), among others.

[24] Upon closer examination it is smaller oil firms that tend to be tax avoiders so they do not make our list of top 100 by size. If we cut the sample by the top 500 largest firms then more oil firms are present.

[25] We recognize that some may argue that if stock options had been expensed for financial accounting, then these firms would not be considered tax avoiders and thus are only there because of a problem with financial accounting. While we recognize this issue to some extent, we also point out that in the late 1990s some of the largest technology companies appear to have been paying no income taxes (at least in the U.S.) because their stock option deductions were greater than their taxable income from other sources.

TABLE 6
Descriptive Data by *CASH ETR10* Tax Group

	Tax Group								
	Low *CASH ETR10* <= 0.20		Mid 0.20 < *CASH ETR10* <= 0.40		High 0.40 < *CASH ETR10*		Differences		
	n	Mean	n	Mean	n	Mean	Mid-Low	High-Mid	High-Low
CASH ETR10	546	0.122	1,224	0.296	307	0.604	0.174***	0.308***	0.482***
SIZE (*Log Assets*)	473	6.834	1,119	6.564	275	5.417	−0.270**	−1.147***	−1.417***
MVE (*$billions*)	421	5.010	966	3.952	225	0.727	−1.058	−3.225***	−4.283***
BM	405	0.509	953	0.501	208	0.632	−0.008	0.131***	0.123***
EP	421	0.078	966	0.090	225	0.071	0.012***	−0.019***	−0.007
ROA	473	0.069	1,119	0.099	275	0.055	0.030***	−0.044***	−0.014***
LEVERAGE	473	0.214	1,119	0.166	275	0.171	−0.048***	0.005	−0.043***
INTANGIBLES	473	0.088	1,119	0.097	275	0.086	0.009	−0.011	−0.002
R&D	473	0.025	1,119	0.019	275	0.028	−0.006**	0.009**	0.003
ADVERTISING	473	0.007	1,119	0.012	275	0.012	0.005***	0.000	0.005**

***, **, * Statistical difference from 0 at the 1 percent, 5 percent, and 10 percent levels, respectively, using a two-tailed test.

Compustat data items in parentheses where applicable.

CASH ETR10 is defined in Table 1.

SIZE = natural log of average total assets (data6); average total assets is computed as total assets (data6) at the end of 2004 plus total assets at the end of 1994 divided by 2;
MVE = price at the end of fiscal year 1994 (data199) multiplied by shares outstanding (data25) at the end of fiscal year 1994 plus the same quantity at the end of fiscal year 2004 divided by 2;
BM = book-to-market ratio computed as book value of common equity (data60) at the end of fiscal year 1994 plus the same quantity at the end of fiscal year 2004 divided by 2, all divided by *MVE*;
EP = earnings-to-price ratio computed as the mean of earnings before tax and special items (data170–data17) between 1995 and 2004 divided by *MVE*;
ROA = firm's return on assets and is computed as the mean of earnings before tax and special items (data170–data17) between 1995 and 2004 divided by average total assets;
LEVERAGE = long-term debt (data9)/total assets at the end of 1994 plus the same ratio and the end of 2004, divided by 2;
INTANGIBLES = ratio of intangibles (data33) to total assets at the end of 1994 plus the same ratio at the end of 2004, divided by 2;
R&D = average research and development expense (data46) scaled by average total assets; and
ADVERTISING = average advertising expense (data45) divided by average total assets, where *ADVERTISING* is missing it is assumed to equal 0.

Two hundred ten firms do not have data in 1994 necessary to calculate the beginning of year 1995 values resulting in 1,867 firms with meaningful observations of *CASH ETR10*, and values of the displayed firm characteristics. Additional observations are lost for *MVE*, *EP*, and *BM* because of missing values for *MVE* in 1994 and negative or missing values of common equity (data60).

than 40 percent (High). The data reveal that the long-run tax avoiders are slightly larger, have a lower earnings-to-price and lower return-on-assets than do firms with a *CASH ETR10* between 20 percent and 40 percent. The long-run tax avoiders are also more highly leveraged and spend more on R&D but less on advertising. From this initial review of these data it appears that long-run tax avoiders are larger than firms with higher tax rates, suggesting economies of scale to tax avoidance. The greater spending on research and development likely saves taxes through the research and experimentation tax credit, but could also be contributing to the lower return on assets (ROA) and earnings-to-price (EP) since these costs are expensed in full for financial accounting. The lower spending on advertising by the long-run tax avoiders is consistent with the idea that firms very susceptible to public punishment (those with higher spending on advertising) may not avoid taxes to such a large degree because they fear a public backlash for poor corporate citizenship (see Hanlon et al. 2007; Hanlon and Slemrod 2007).

The high tax rate firms are much smaller in size relative to the other two groups of firms, especially in terms of market value. The high tax rate firms have higher research and development spending as compared to the firms with a long-run cash effective tax rate between 20 and 40 percent. Both high-tax and low-tax firms have lower ROA and lower EP ratios than firms in the middle tax group, suggesting the results are not driven by performance. That is, if long-run cash effective tax rates were driven by profitability (i.e., firms with more profits pay more tax), ROA should increase monotonically across the *CASH ETR10* groups. While the univariate analysis does show some patterns in the characteristics of long-run tax avoidance, we leave a more detailed analysis of the determinants and consequences long-run tax avoidance to future research.

V. CONCLUSIONS

Despite decades of tax research, little is known about firms' ability to avoid income taxes over long periods of time. The purpose of this study is to shed some initial evidence on this question. We find a significant fraction of firms that appear to be able to successfully avoid large portions of the corporate income tax over sustained periods of time. Using a ten-year measure of tax avoidance, 546 firms, comprising 26.3 percent of our sample, are able to maintain a cash effective tax rate of 20 percent or less. The mean firm has a ten-year cash effective tax rate of approximately 29.6 percent. This suggests that tax avoidance is concentrated in a subset of firms. Examining the relation between annual cash effective tax rates and long-run cash effective tax rates, the evidence is not consistent with annual cash effective tax rates being good predictors of long-run cash effective tax rates. Thus, the use of an annual rate to examine tax-avoidance behavior could lead to erroneous inferences about the long-term behavior of firms.

In addition, the data indicate that annual cash effective tax rates exhibit some year-to-year persistence, but that the persistence is asymmetric. Low-cash effective tax rates have greater persistence than do high-cash effective tax rates. Thus, a high annual cash effective tax rate is much more transitory while low rates are more likely to be sustainable over long periods of time. The persistence of low annual cash effective tax rates and the apparent ability of firms to avoid taxes in the long run could be driven by management actions to avoid taxes or by inherent differences in the groups of firms. In a preliminary examination of data related to these issues, there is some evidence of industry effects, although a great deal of variation in cash effective tax rates is not explained by industry. We leave a more detailed analysis of the causes and consequences of long-run tax avoidance to future research.

There are a number of unanswered questions regarding long-run tax avoidance. First, why is there so much variation, even among firms in the same industry, in the extent to which firms avoid taxes? Second, is long-run tax avoidance valued by the market? There are reasons why it might not be. Under certain conditions, avoidance of explicit taxes comes at the price of bearing implicit taxes—reductions in pretax rates of return. Third, do firms that exhibit long-run tax avoidance appear to suffer any tax consequences such as increased litigation for alleged tax shelters? If, as is likely, tax sheltering is an endogenous choice based on having high tax rates prior to engaging in the shelter, then the answer to this question would be no, contrary to many people's priors. Finally, is there any connection between long-run tax avoidance and symptoms of governance breakdowns such as accounting fraud, as would be suggested by Desai and Dharmapala (2007)? These are some of the many questions that we hope will be addressed in future research.

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The Contagion Effects of Accounting Restatements

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ABSTRACT: We predict and find that accounting restatements that adversely affect shareholder wealth at the restating firm also induce share price declines among non-restating firms in the same industry. These share price declines are unrelated to changes in analysts' earnings forecasts, but instead seem to reflect investors' accounting quality concerns. Peer firms with high industry-adjusted accruals experience a more pronounced share price decline than do low-accrual firms. This accounting contagion effect is concentrated among revenue restatements by relatively large firms in the industry. We also find that investors impose a larger penalty on the stock prices of peer firms with high earnings and high accruals when peer and restating firms use the same external auditor. Our results are consistent with the notion that some accounting restatements cause investors to reassess the financial statement information previously released by non-restating firms.

Keywords: *accounting quality; contagion; earnings quality; information transfer.*

JEL Classification: *G34; D80.*

Data Availability: *Data are available from public sources.*

I. INTRODUCTION

This paper investigates whether and how announced accounting restatements that induce a shareholder loss at the correcting firm affect the share prices of non-restating firms. Our study is motivated by two streams of empirical research. One research

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stream documents the shareholder losses suffered when accounting misstatements are discovered and prompt financial statement corrections (Anderson and Yohn 2002; Palmrose et al. 2004), enforcement actions by the SEC (Feroz et al. 1991; Dechow et al. 1996), or lawsuits by shareholders (Kellogg 1984; Francis et al. 1994). A second research stream documents the information transfer effects associated with sales and earnings announcements, management forecasts of earnings, and bankruptcy announcements (e.g., Foster 1981; Pyo and Lustgarten 1990; Freeman and Tse 1992; Lang and Stulz 1992; and Ramnath 2002).

Building on these research streams, we provide evidence on whether accounting misstatements discovered at one firm cause investors to reassess the content and credibility of financial statements issued by other firms in the same industry. Specifically, we predict and find that restatements that induce a shareholder loss at the correcting firm also induce a statistically reliable share price decline among non-restating firms in the same industry. This share price decline does not just reflect investors' expectations of diminished economic prospects for the industry or peer firm because it is unrelated to changes in analysts' earnings per share (EPS) forecasts coincident with the restatement. Instead, we find that the share price decline is larger for peer firms with low accounting quality (i.e., high industry-adjusted accruals). Accounting contagion is concentrated among revenue restatements by relatively large firms in the industry. We also find that investors impose a larger penalty on the stock prices of peer firms with high earnings and high accruals when peer and restating firms use the same external auditor.

Our paper makes an important contribution to the literature on accounting quality and investor behavior. One strand of that literature finds evidence of a higher cost of equity capital for firms with low financial disclosure quality (Botosan 1997; Botosan and Plumlee 2002), low earnings quality, and low accruals quality (Francis et al. 2004, 2005). These findings confirm that investors routinely price accounting and disclosure quality, although little is known about when and how they do so. Accounting quality concerns may arise from financial press commentaries that target a particular firm or accounting controversy (Foster 1979), from analysts' research reports (Fairfield and Whisenant 2000), or from firm-initiated announcements about a discovered accounting misstatement or the onset of an accounting probe (Anderson and Yohn 2002; Palmrose et al. 2004). Informational events of this sort help shape investors' accounting quality assessments by highlighting the firm's questionable accounting practices. This paper shows that restatements also serve as a catalyst for investors to reassess the past financial statements of other, similar firms.

The remainder of the paper is organized as follows. Section II summarizes prior research and develops testable implications about the contagion effects of restatements. Section III describes sample selection procedures and provides descriptive information about the restatement events that are the focus of our contagion tests. Section IV presents our empirical results and Section V contains concluding remarks.

II. ACCOUNTING RESTATEMENTS AND INFORMATION CONTAGION

Articles in the financial press suggest that an accounting restatement by one firm may cause investors to alter their assessments of financial statement information issued by other firms in the industry. Consider, for example, Great Atlantic & Pacific Tea Company's (A&P) $36.8 million restatement in 2002. The restatement was prompted by an internal investigation into the company's accounting for vendor allowances.[1] A&P's stock price fell 16 percent the day the restatement was announced.

A *Wall Street Journal* article on the A&P restatement quoted one industry analyst who said that vendor allowances are "a very complicated area of accounting that's only now getting a lot of [investor] attention" (Covert 2002b). Few (if any) grocery companies disclosed details of their vendor allowance accounting practices in financial statement footnotes. The article concluded by noting that two of A&P's competitors (Kroger Co. and Winn-Dixie Stores) quickly confirmed their continuing use of the more conservative accounting approach just adopted by A&P. Public confirmation was presumably meant to dispel investor concern about aggressive accounting.

Two other grocery companies (Safeway and Albertson's) "didn't immediately respond to requests for comment" (Covert 2002a), leaving investors and analysts in doubt as to whether these firms' previously reported financial results were tainted. One industry analyst predicted that other (unnamed) grocery retailers would eventually restate earnings because of improper accounting for vendor allowances. Two grocery firms (Flemmings Cos. and U.S. Foodservices) did so during the ensuring nine months.[2]

Prior Research on Accounting Restatements

Management has a duty to correct inaccurate, incomplete, or misleading financial statement disclosures in Securities and Exchange Commission (SEC) filings if the statements are "discovered to have been false and misleading from the outset, and the issuer knows or should know that persons are continuing to rely on all or any material portion of the statements" (Sec. Act Rel. 6084, 17 SEC Dock. 1048, 1054 1979).[3] Once identified, the nature of the accounting misstatement and its financial statement effect must be disclosed.[4]

Correcting an accounting misstatement constitutes *de facto* admission that previously issued financial statements contain misrepresentations, and may entail legal liability for management and external auditors (Kellogg 1984; Francis et al. 1994; Karpoff et al. 2006b). Correction of the misstatement may alter investors' perception of the firm's past performance or future prospects. Financial statement credibility may also be diminished if the circumstances of the misstatement raise questions about management integrity, internal control adequacy, audit committee oversight, or external auditor independence. It is therefore not surprising that restatement announcements convey unfavorable information to investors in restating firms.

Prior research shows that the stock prices of restating firms fall, on average, by somewhere between −6 percent (Dechow et al. 1996) and −10 percent (U.S. General Accounting Office [GAO] 2003; Palmrose et al. 2004) when the restatement is first made public. The price decline is most pronounced when the restatement involves egregious accounting irregularities or fraud, and culminates in enforcement action by the SEC or Department of Justice (Karpoff et al. 2006a). Harsh legal penalties and regulatory sanctions are imposed on executives and auditors who knowingly participate in the preparation of fraudulent or misleading financial statements (Karpoff et al. 2006b). More generally, restatements often precipitate top executive turnover (Desai et al. 2006) and are followed by shareholder litigation against the company, its management, board of directors, and external auditors (Griffin 2003; Palmrose and Scholz 2004), by a decline in sell-side analysts' consensus annual EPS forecasts and an increase in forecast dispersion (Palmrose et al. 2004; Hribar and Jenkins 2004), and by an increase in the implied cost of equity capital (Hribar and Jenkins 2004).

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[1] The restatement also corrected comparatively small mistakes in the accounting for perishable inventory, self-insurance reserves, and closed store subleases.

[2] Safeway and Albertson's both changed their accounting for vendor allowances in 2003, but neither firm issued a formal restatement. Instead, they opted for prospective application of Emerging Issues Task Force Issue (EITF) No. 02-16, *Accounting by a Customer (Including a Reseller) for Certain Consideration Received from a Vendor*, which became effective in the first quarter of 2003.

[3] Our operational definition of an accounting restatement does not include changes in accounting principle that requires retroactive treatment, the use of the "pooling-of-interests" method for business combinations and discontinued operations or correction of prior interim financial reports when there is an adjustment (or settlement) of litigation or similar claims provided that certain GAAP criteria are met.

[4] Some restatements in our sample were first reported in press releases, others in Form 8-K filings, and still others became known only when the final amended financials statements were filed. SEC rules adopted in August 2004 now require companies to file a Form 8-K within four days of discovering a misstatement in previously issued financial statements. These rules also greatly expand the scope of information required to be disclosed about the misstatement.

Some restatements correct unintentional accounting *errors* involving minor—but nonetheless material—clerical mistakes, financial software malfunctions, or inadvertent misapplications of accounting policies.[5] Restatements of this sort tend to have minimal financial statement impact and little or no discernable effect on the share prices of restating firms (Anderson and Yohn 2002; GAO 2003; Richardson et al. 2003). Kinney and McDaniel (1989) find that shareholder losses are negligible when the correction involves only one or two prior quarterly filings and thus likely stems from an accounting error. Palmrose et al. (2004) find that 29 percent of the restatement announcements in their sample do not adversely affect shareholder wealth.[6]

In summary, the central message from prior research is that some (but not all) restatements adversely affect shareholder wealth. Two forces may be responsible for the share price decline observed for restating firms. First, a restatement makes clear that the firm's previously issued financial statements were tainted, thus causing investors to alter their perceptions about the content and credibility of the restating firm's financial statements. Second, a restatement may also convey unfavorable information about the restating firm's economic prospects. Prior research has not attempted to disentangle the two effects, and evidence consistent with both can be found in the literature.

Prior Research on Accounting Information Transfers

An intra-industry information transfer occurs when news released by one firm affects the stock prices of other firms in the industry.[7] The typical information transfer study proceeds in three steps. First, the stock return behavior of announcing firms is examined to isolate any share price movements that accompany the news event of interest (e.g., a bank failure). Next, stock returns coincident to the news announcement are computed for a sample of non-announcing firms (e.g., other banks). Information transfer effects are presumed present when the mean event-period stock return for non-announcing firms is reliably different from zero. Finally, corroborating evidence is sought indicating that cross-sectional differences in the stock returns of non-announcing firms can be traced to event-related differences in firm characteristics. In the case of adverse events like bank failures, this step is designed to separate unfavorable "contagion" effects from favorable "competitive" effects and to confirm that contagion stock returns are correlated with firm characteristics that portend bank financial distress.[8] Our empirical procedures are guided by this same approach.

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[5] The distinction between a financial statement *error* and an *irregularity* centers on intent, which is often difficult to determine in practice. Accounting "fraud" involves a high level of what lawyers call *scienter*—that is, knowing and willful conduct—with actions intended to violate the law, misapply accounting standards, and affect financial reporting.

[6] Palmrose et al. (2004) offer three explanations for non-negative stock returns to announced restatements: (1) some restatements involve minor corrections and thus have very little impact on investor perceptions; (2) other information in the press release dampens or offsets the impact of the restatement; or (3) investors anticipate some restatements, perhaps because of industry clustering around specific accounting issues. This last possibility is consistent with our notion of contagion.

[7] Accounting information transfers have been documented for earnings announcements (Foster 1981; Clinch and Sinclair 1987; Pownall and Waymire 1989; Han and Wild 1990; Freeman and Tse 1992; Ramnath 2002), bank loan-loss reserves (Docking et al. 1997) and retailers' monthly sales reports (Olsen and Dietrich 1985). Information transfers are also present for bank failures (Aharony and Swary 1983), bankruptcy filings (Lang and Stulz 1992; Ferris et al. 1997), dividend initiations (Firth 1996), Internet hacker attacks (Ettredge and Richardson 2003), and nuclear accidents (Bowen et al. 1983).

Restatement Contagion Hypotheses

Prior research is silent about whether restatements convey information useful to investors in pricing the common shares of other, similar firms. One possibility is that restatements are extremely idiosyncratic and thus alter investors' expectations about restatement firm value, but leave non-restatement peer firm share prices unchanged. A second possibility is that restatements influence peer firm share prices simply because they provide information about deteriorating economic prospects for the industry. Under this scenario, restatements are predicted to induce a downward revision in analysts' earnings forecasts for peer firms and those forecast revisions should explain the contagion stock returns experienced by peer firms. Of course, our primary interest lies in a third possibility—namely that restatements function as a catalyst for altering investors' perceptions about the financial statements issued by other (non-restating) firms in the industry. In this case, contagion stock returns will be positively correlated with variables that proxy for differences in the quality of peer firms' reported financial information.

Accounting restatements are likely candidates for information contagion related to either changing industry prospects or to accounting quality concerns. As prior research has demonstrated, some (but not all) restatements produce an immediate and economically large share price decline at the announcing firm. We conjecture that this unfavorable information will spill over to non-restating firms in the same industry; firms that are presumably engaged in similar business transactions, face similar industry prospects, and use similar accounting practices. Consequently, our first hypothesis predicts a contagion effect:

> **H1:** The share prices of non-restating firms in the same industry will decline in response to accounting restatements that produce large share price declines at the announcing firm.

Prior research suggests that a restatement-induced contagion share price effect, if present, is likely to be small in magnitude and thus difficult to detect in broad samples of peer firms. In studies of contagion effects due to bankruptcy filings (Lang and Stulz 1992) and loan-loss reserve increases (Docking et al. 1997), the contagion share price effects are only about 4 percent as large as the mean share price decline experienced by announcing firms. Consequently, we suspect that the average restatement-induced contagion share price effect will also be small in magnitude. In our setting, differences in accounting quality among peer firms presumably result in small contagion effects for some firms and large contagion effects for others.

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[8] Contagion effects are present when an adverse event at one firm also conveys *negative* information about the valuation of other firms, for example, when the failure of one bank portends financial distress at other banks that have similar clientele, lending practices, and geographical concentration. Competitive effects are present when the adverse informational event conveys *favorable* information about related firms, for example, when the failure of one bank is expected to induce predatory responses by competitors that yield increased market share and profitability.

Our second research hypothesis tests this conjecture by examining whether the contagion stock returns of peer firms are correlated with differences in accrual measures of accounting quality. Anecdotal evidence in financial press articles lends credence to this hypothesis. Some restatements apparently cause analysts and investors to scrutinize the accounting practices and financial disclosures of other firms in the industry to determine whether non-restating firms employ dubious accounting practices or otherwise misrepresent their financial performance in a manner similar to that of the restating firm. The share prices of suspect firms then decline as investors alter their perceptions about the content and credibility of firms' past financial statements. Evidence of a positive association between contagion stock returns and accounting quality differences would provide support for the notion that restatements trigger heightened financial statement skepticism by investors.[9] Accordingly, our second research hypothesis is:

> **H2:** Restatement-induced contagion share price effects will be positively associated with cross-sectional differences in accounting quality as measured by accrual-related financial statement characteristics.

Our tests include controls for concurrent information about changes in firms' economic prospects (Palmrose et al. 2004), capital market pressures confronting management (Richardson et al. 2003), and the severity of the restatement.

Our final hypothesis predicts that restatement contagion will be most pronounced among peer firms that subsequently issue an accounting restatement. We conjecture that investors respond to restatements involving commonly used accounting practices (e.g., vendor allowances at A&P) by correctly altering their assessment of the probability that other firms in the industry will subsequently disclose and correct misstatements similar to those uncovered at the restating firm. Our third research hypothesis is:

> **H3:** Peer firms that later announce their own restatement will exhibit larger contagion share price declines than non-restating peer firms.

The intuition underlying this partial anticipation hypothesis also implies that investors will be less surprised than they otherwise would have been by subsequent restatements in the industry when those restatements involve similar accounting and reporting issues.

III. SAMPLE SELECTION AND RESTATEMENT FIRMS' SHARE PRICE BEHAVIOR

Stock Return Measurement and Restatement Events

Size-adjusted daily common stock returns are used to document the share price response to announced accounting restatements. Size-decile returns constructed from NYSE, AMEX, and NASDAQ listed firms are from CRSP. Announcement buy-and-hold abnormal stock returns are cumulated over a three-day window (day −1 to day +1) that spans the day of the first press release describing the accounting misstatement (day 0). CRSP delisting returns are included if available.

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[9] There are two ways in which increased investor skepticism can induce a contagion stock price decline among peer firms. Investors who fear that a peer firm's financial statements are tainted might lower their expectations for future earnings and cash flows. This response recognizes that past levels of tainted earnings and cash flow are less persistent than previously thought. Alternatively, investors might just increase the discount rate applied in an equity valuation model to expected (but unadjusted) future earnings or cash flows to reflect information risk. Substantial disagreement exists about whether information risk is priced (Core et al. 2007; Francis et al. 2005; Lambert et al. 2006). We acknowledge the debate but remain agnostic about its implication for our research. Moreover, our cross-sectional accruals tests are not intended to disentangle the two potential explanations for a contagion price reaction.

Our initial sample of 919 restatement events is from the GAO (2003) and comprises nearly all public company restatements from January 1, 1997 to June 30, 2002. We augment this sample with 185 restatements identified in *Wall Street Journal* articles published between January 1, 1990 and December 31, 1996.[10] Restatement announcement dates (denoted day 0) are from the GAO (for events after January 1, 1997) or are hand-collected from *Wall Street Journal* articles (for events before January 1, 1997).[11] Restatements are discarded if CRSP announcement period common stock returns are unavailable (154 events), or the restating firm lacks an industry peer group comprised of at least five firms (62 events). This yields a preliminary sample of 888 restatements involving 807 firms.

Figure 1 depicts the frequency of announced restatements by calendar quarter and GAO focus category (e.g., "revenue recognition" as defined in the Appendix) for the preliminary sample. Each event is assigned to one of the nine GAO categories that best reflects the primary (but not exclusive) accounting misstatement uncovered at the firm. Restatements involving most GAO focus categories occur throughout the sample period and become more frequent through time. A notable exception to this pattern is "in-process research and development" (IPR&D) restatements, which are predominantly clustered in a single calendar quarter. Even though the preliminary sample exhibits calendar quarter clustering, there is minimal event *date* clustering of restatement announcements involving the same accounting focus and industry.[12]

To enhance our ability to detect restatement-induced stock price contagion, we eliminate 338 events (38.1 percent of the preliminary sample) where restatement is initially announced as part of the firm's routine quarterly earnings press releases. These events tend to involve minor misstatements in past quarterly (but not annual) filings. Their inclusion in the sample presents a problem because information transfer effects are known to be associated with quarterly earnings releases.

We also discard restatements that fail to convey unfavorable information about the restatement firm's value. Specifically, events are discarded if the announcement period abnormal stock return is either positive (135 events) or lies between zero and −1.0 percent (24 events) because inclusion of these events would add noise to the analysis.[13] We also

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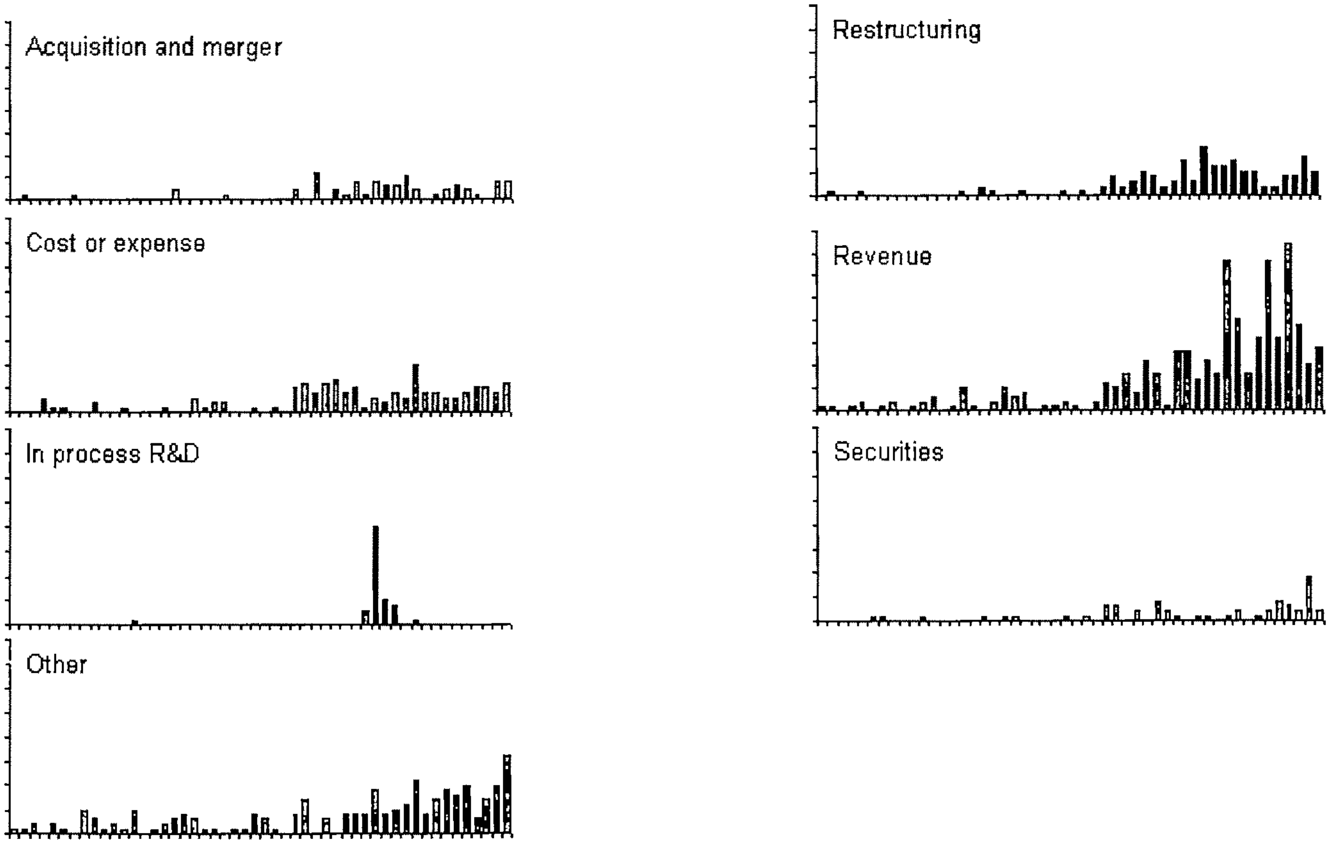
[10] The Dow Jones Interactive™ database was searched electronically for *Wall Street Journal* articles containing the text strings CORRECTION, ERROR, REVISION, or RESTATEMENT in conjunction with ACCOUNTING, EARNINGS, FINANCIAL STATEMENTS, or RESULTS. Approximately 2,200 articles were identified. Each article was then read and discarded from further consideration if the restatement: (1) failed to satisfy the GAO selection criteria for inclusion (U.S. GAO 2003) or (2) involved a U.S. firm not listed on the CRSP database or a foreign firm.

[11] We confirm GAO announcement dates against company press releases and 8-K filings, and uncover 24 cases where the restatement is first disclosed earlier than the GAO date. We use the earlier confirmed press release or 8-K date where there is a conflict.

[12] Only about 3 percent of the restatements in our preliminary sample of 888 events occur within three trading days of one another, and less than 6 percent occur within 10 trading days, when clustering is assessed by industry and accounting focus category.

[13] Press releases for the 20 events with the largest positive three-day abnormal return (mean return of 28.2 percent, range from 17.3 percent to 53.4 percent) were examined to identify the likely source of positive restatement announcement stock return. Nineteen press releases describe accounting errors in quarterly (but not annual) financial statements that were quickly discovered and corrected by management. These releases also contain information about favorable earnings pre-announcements, confirmation of a bankruptcy reorganization plan, or board approval of a stock repurchase plan and rights offering. The final press release announces discovery and correction of a computer error that had *understated* earnings for the prior nine months.

FIGURE 1
Frequency of Restatements by GAO Accounting Focus Category and Calendar Quarter from January 1990 through June 2002



The vertical axis of each graph ranges from zero to 40. Each segment of the horizontal axis denotes a calendar quarter. Accounting focus categories are from the U.S. GAO (2003) study and are described in the Appendix.

eliminate 11 remaining IPR&D restatements because they are transaction-specific and clustered in calendar time. Moreover, they have no discernable average impact on the share prices of restating firms nor do they produce contagion stock price effects among peer firms (Banyi 2006).

Our final sample is comprised of 380 restatements that adversely affect shareholder wealth at the restating firm. These restatements involve firms in every economic sector but are more prevalent among information technology firms (roughly 30 percent of the sample) and consumer discretionary firms (18 percent of the sample). There is almost no time-series clustering of restatement announcements by industry and GAO focus category evident in the final sample.[14]

Non-Restating Peer Firms

Non-restating peer firms are identified from Compustat's active and research data files using historical eight-digit Global Industry Classifications Standard (GICS) codes.[15] Industry peer firms are retained if: (1) announcement period (day −1 to day +1) stock returns are available on CRSP; (2) analysts' consensus annual earnings per share (EPS) forecasts are available from I/B/E/S for one month before and one month after the restatement announcement; (3) the pre-announcement stock price is at least $5; and (4) the peer firm has not announced an accounting restatement within the preceding 24 months. Changes in analysts' EPS forecasts are used to control for the possibility that restatement announcements also convey information about the economic prospects for the industry as a whole or for individual peer firms.[16] Firms with stock prices below $5 are excluded to mitigate potential trading liquidity problems that might add noise to the analysis. We retain peer firms that issue a restatement at a later date as long as they meet the other sample selection criteria.

This process produces a peer group sample comprised of 22,510 firms or about 59 peer firms for each restatement event. Each peer group is comprised of at least five firms to diversify the impact of any idiosyncratic price movements that might otherwise confound our contagion tests.

Stock Price Behavior of Restating Firms

Table 1 reports descriptive statistics on the stock return behavior of restating firms. Size-adjusted abnormal returns are calculated for the announcement period (days −1 to +1), the pre-announcement window (days −10 to −2) and two post-announcement windows (days +2 to +10 and days +2 to +60) to capture information about share price behavior around the restatement announcement. The data in Panel A confirm that the restatements in our sample are accompanied by a reliably negative mean three-day announcement period abnormal return of −19.8 percent.

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[14] The final sample contains one industry-by-focus event that occurs within three trading days of another event, and just four events that occur within 10 trading days of each other. Our results are not altered when these clustered events are excluded from the sample.

[15] Bhojraj et al. (2003) show that GICS classifications are better at explaining stock return co-movements, valuation multiples, forecasted and realized earnings growth rates, R&D expenditures, and various financial ratios (e.g., ROE) than are Standard Industrial Classification (SIC) codes or Fama and French (1997) industry groups. An alternative approach for identifying peer firms is based on common coverage among sell-side analysts (Ramnath 2002). Despite its intuitive appeal, this approach does not yield a unique set of peer firms in all instances and is not used here.

[16] Requiring peer firms to be in the I/B/E/S data file allows us to control for changes in analysts' EPS expectations but tilts the non-restatement sample away from small, low-growth firms in each GICS industry.

TABLE 1

Abnormal Daily Stock Returns for 380 U.S. Firms That Announced Accounting Restatements from January 1990 through June 2002 and Their Non-Restatement Industry Peer Firms

	Restatement Firms			Peer Firms		
	n	Mean	Median	n	Mean	Median
Panel A: Restatement Returns						
Announcement (day −1 to +1)	380	−19.8%^{t}	−14.6%	22,510	−0.5%***	−0.5%
Pre-announcement (day −10 to −2)	380	−4.6%^{t}	−3.8%	22,510	−0.8%***	−0.8%
Post-announcement (day +2 to +10)	380	−2.1%^{t}	−0.7%	22,510	−0.7%***	−0.7%
Post-announcement (day +2 to +60)	380	−10.3%^{t}	−10.9%	22,510	0.2%	−0.1%
Panel B: Announcement Returns by Accounting Focus						
Revenue recognition	148	−21.5%^{t}	−17.1%	7,615	−0.5%***	−0.9%
Cost or expense	45	−19.9%^{t}	−16.9%	2,407	−0.4%***	−0.3%
Restructurings and write-downs	49	−19.7%^{t}	−13.4%	1,583	−0.4%**	−0.6%
Acquisitions and mergers	26	−16.1%^{t}	−7.4%	1,763	−0.3%*	−0.6%
Securities	22	−11.7%^{t}	−5.1%	1,936	−1.5%***	−0.7%
Other	90	−20.1%^{t}	−13.5%	7,206	−0.3%***	−0.4%
	380			22,510		

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*, **, *** Denotes a statistically significant two-tailed t-test of the null hypothesis that the mean cumulative abnormal return is different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

Restatements announced concurrently with quarterly or annual earnings are excluded from the sample as are those where the three-day announcement period abnormal stock return for the restating firms is equal to or greater than −1.0 percent. Restating firms' announcement period stock returns are therefore different from zero by construction (denoted by "t" in the table) because the sample is restricted to restatements that adversely affect shareholder wealth at the restating firm. Non-restating peer group firms are identified from Compustat using the eight-digit Global Industry Classifications Standard (GICS) of the corresponding restating firm. Non-restating firms are discarded if: (1) CRSP stock returns for the announcement period plus the following 240 trading days are not available on the CRSP data files; (2) analysts' consensus earnings per share forecasts issued immediately before and after the restatement announcement are not available on the I/B/E/S data files; (3) the pre-announcement stock price is less than $5; or (4) the peer firm restated its own financial statements within the preceding two years.

Daily stock returns are size adjusted using CRSP NYSE/AMEX/NASDAQ market capitalization decile returns and are then compounded over time to reflect a "buy and hold" return. Day 0 is the trading date of the first restatement-related press release issued by the restating firm. Accounting focus categories correspond to the GAO (2003) groupings as described in the Appendix.

Restating firms also exhibit a reliably negative mean abnormal return of −4.6 percent over the nine trading days preceding the announcement. This pre-announcement share price decline could reflect bad news unrelated to the restatement, information leakage related to the restatement, or partial anticipation triggered by other restatements. The mean abnormal return for restating firms is −2.1 percent over the nine trading days following the press release announcement, and −10.3 percent over the entire 59-day post-announcement period. This post-announcement share price decline has been documented elsewhere and likely reflects the resolution of investor uncertainty about the circumstances, magnitude, and scope of the misstatement and other related bad news.

Panel B of Table 1 reports the three-day abnormal stock returns of restating firms by accounting focus using the five broad GAO (2003) categories in the Appendix. The mean three-day abnormal return for restating firms varies from −21.5 percent for "revenue recognition" misstatements to −11.7 percent for "securities" misstatements. In summary, the restatements that form the basis for our contagion tests involve a range of accounting issues and (by construction) are associated with substantial share price declines among restating firms.

IV. STOCK PRICE REACTION OF NON-RESTATING PEER FIRMS

Share Price Behavior of Non-Restating Firms

Descriptive statistics summarizing the abnormal stock returns of peer firms are reported in Table 1. Non-restating peer firms experience a reliably ($p < 0.01$) negative mean three-day abnormal return of −0.5 percent when an accounting misstatement is first announced by another firm in the industry. This result is consistent with the notion that announcement of a discovered accounting misstatement by one firm in the industry triggers information contagion among peer firms. The mean price decline for peer firms in our sample is small but comparable in magnitude to earlier contagion studies (i.e., Lang and Stulz 1992; Docking et al. 1997).

Non-restating peer firms experience a reliably negative −0.8 percent average share price decline over the pre-announcement period. This pre-announcement share price decline mirrors that experienced by restating firms and could reflect bad news unrelated to the discovered misstatement, information leakage related to the announced misstatement, or partial anticipation effects triggered by other recently announced restatements. Peer firms' share prices continue to drift downward until about day +10 (−0.7 percent mean abnormal return).[17] Some degree of post-announcement drift might be expected in this setting because it is a time-consuming task for investors to gather and evaluate information about the circumstances of the misstatement and the specific accounting issues involved, determine whether the accounting practices of other firms in the industry are likely to be tainted, and then assess the share price implications of this accounting quality concern.

Panel B of Table 1 reports the mean three-day announcement period abnormal stock return for non-restating peer firms by accounting focus. A reliably negative share price decline is present for each GAO accounting focus category, with the largest decline occurring for "securities" restatements (−1.5 percent). "Securities" restatements involve financial services firms and the distinctly homogeneous nature of GICS industries in this economic sector may partially explain why the contagion share price decline is so large relative to that for restating firms (−11.7 percent).

Contagion Stock Returns and Analysts' Earnings Forecast Revisions

In this section, we investigate whether a restatement by one firm in the industry affects analysts' EPS forecasts for peer firms and, if so, whether these forecast revisions then explain the share price behavior of peer firms. Palmrose et al. (2004) find that restatements are accompanied by a statistically significant −6.7 percent decline in the sell-side analysts' consensus (scaled) annual EPS forecasts. Moreover, this EPS forecast revision exhibits a positive cross-sectional association with restatement firms' announcement period share price declines. These forecast revisions may simply reflect the mechanical consequences of correcting the misstatement as, for example, when costs improperly capitalized in the past are now to be expensed as incurred. Alternatively, restatement firms' forecast revisions may arise because restatements alert analysts and investors to the deteriorating economic prospects of the announcing firm and, perhaps, its industry.

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[17] There is a very small, but statistically reliable, positive correlation between the announcement period stock returns of peer firms' and both their pre-announcement returns ($\rho = 0.02$) and their post-announcement returns over days +2 through +10 ($\rho = 0.01$). This pattern is also present among restating firms.

To distinguish between these two possibilities, we investigate whether peer firms also experience downward earnings forecast revisions when the restatement is announced. We measure the change in analysts' annual EPS forecasts over a 60-day period that begins with the I/B/E/S consensus forecast issued immediately prior to the restatement announcement. Our composite forecast revision measure is the average dollar change in the consensus one-year- and two-year-ahead EPS estimates for a given peer firm, scaled by pre-announcement share price.

Peer firms exhibit a statistically significant but small −0.6 percent decline in analysts' (scaled) annual EPS forecasts after a restatement announcement by another firm in the industry. This result is consistent with the notion that restatements convey some new information about deteriorating economic conditions in the industry or, alternatively, that they tend to occur when the industry's prospects are otherwise declining. However, EPS forecast revisions are statistically unrelated to the three-day abnormal stock returns of peer firms.[18] This finding indicates that changes in analysts' expectations about future economic performance, as captured by their EPS forecast revisions, do not explain the contagion stock returns of non-restating firms.

Contagion Stock Returns, Accounting Quality, and Capital Market Pressure

This section investigates whether restatement-induced contagion stock returns are correlated with measures of accounting quality (*AQ*) and capital market pressure for aggressive accounting (*PRESS*); i.e., constructs that prior research has shown predict the likelihood of restatement (Richardson et al. 2003). If the share price declines of peer firms do indeed reflect investors' heightened concern about tainted financial statements, then contagion stock returns should exhibit a positive association with contemporaneous measures of accounting quality and a negative association with capital market pressures for aggressive accounting. On the other hand, finding no association between contagion stock returns and accounting quality or capital market pressure would cast doubt on our conjecture that a restatement by one firm triggers a reassessment by investors of the financial statements of other firms in the industry.

Our cross-sectional regression analysis of size-adjusted three-day stock returns (CAR_i) has the following general form:

$$CAR_i = \alpha_0 + \beta_1 AQ_i + \beta_2 PRESS_i + \sum_{k=3}^{9} \beta_k Control_{ki} + \varepsilon_i \qquad (1)$$

where the variables of interest capture information about peer firm accounting quality (*AQ*) and capital market pressure (*PRESS*). The model specification includes several control variables (described below) and year fixed-effect indicators to partially mitigate the influence (if any) of restatement announcement calendar year.

Our proxy measures for accounting quality follow from earlier studies showing that large accounting accruals predict restatements (Richardson et al. 2003) and SEC enforcement actions (Dechow et al. 1996). As a baseline, we first estimate the cross-sectional regression of contagion stock returns using industry-mean-adjusted annualized quarterly earnings (*EARN*) as the accounting quality measure. The baseline model establishes whether contagion stock returns are associated with differences in the relative profitability of peer firms. We then decompose industry-adjusted *EARN* into operating cash flow and total accruals (*CFO* and *TACC*, respectively) to isolate accounting accruals and thus capture information about potential differences in the quality of earnings reported by peer firms.[19] *TACC* reflects both operating and investing accruals for the period and thus serves as a comprehensive measure of accrual behavior that incorporates all nonfinancing accrual transactions. Finally, *TACC* is decomposed into its operating and investing components (*OPER_ACC* and *INV_ACC*) so that the incremental contribution of each type of accrual can be assessed. Contagion stock returns (*CAR*) are predicted to be negatively associated with industry-adjusted total accruals, operating accruals, and investing accruals consistent with the notion that restatement-induced contagion share price declines are larger among peer firms with relatively low-quality earnings.

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[18] The coefficient estimates and t-statistics from our untabulated regression of scaled EPS forecast revisions on peer firms' three-day stock returns for the 22,510 non-restatement firms in Table 1 are: intercept of −0.00561 ($t = -16.78$) and EPS forecast revision coefficient of +0.00071 ($t = 0.34$). The regression F-statistic is 0.12 ($p = 0.73$). For estimation purposes, we eliminate influential outlying observations with leverage values exceeding 2 (Belsley et al. 1980).

To capture information about capital market pressures for aggressive accounting choices and thus about the *ex ante* likelihood of restatement, we rely on prior evidence from Richardson et al. (2003). They find that investors' perceptions of future earnings growth, as measured by book-to-market (*BM*) and earnings-to-price (*EP*) ratios, are negatively related to the probability of restatement. Peer firms that trade at substantial multiples of book value and earnings (i.e., low *BM* and *EP*) presumably face greater pressure to adopt aggressive accounting practices to deliver the anticipated earnings growth. Richardson et al. (2003) also find that firm *SIZE* (measured as the natural logarithm of equity market value) is positively related to the probability of restatement. Larger firms are subject to closer scrutiny by the investment and analyst community, and this heightened scrutiny contributes to increased capital market pressure for aggressive accounting choices. Two other variables shown to be predictive of future restatements are *EPS_GROWTH* firms with increases in year-over-year quarterly EPS in each of the four quarters prior to restatement, and *STRING* firms with small positive forecast errors in each of the prior four quarters.[20] Richardson et al. (2003) find that *EPS_GROWTH* is positively related to the probability of restatement, while *STRING* is negatively related.

Although we limit the sample to restatements that adversely affect shareholder wealth at the restating firm, we include the restating firm's three-day abnormal stock return (*RESTRET*) to control for differences in investor perceptions of the severity and importance of the restatement and related information in the announcement. Events that investors deem to be relatively inconsequential will have *RESTRET* values closer to zero and are less likely to provoke peer firm contagion. *REST_SIZE* is the restating firm's equity market value decile rank on CRSP. Restatements by relatively large firms in an industry are likely to provoke greater contagion than are those at small firms. *REVISION* is the scaled composite change in analysts' consensus one-year- and two-year-ahead EPS forecasts for the peer firm (see the "Contagion Stock Returns and Analysts' Earnings Forecast Revisions" section), and controls for changes in expectations about future performance. *LEV* is measured as total debt-to-equity ratio and controls for the well-known influence of leverage on observed stock price reactions to informational events.

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[19] Earnings, cash flow, and accrual variables are "annualized" by accumulating quarterly amounts over the four fiscal quarters preceding the restatement announcement. Annualized amounts are then industry-mean adjusted using sample means for all non-restating peer firms available on Compustat so that the resulting variables measure abnormal levels of profitability, cash flow, and accruals. Earnings (*EARN*) is income before extraordinary items, scaled by average assets; total accrual (*TACC*) is *EARN* minus the sum of operating cash flow (*CFO*) and investing cash flow, scaled by average assets; operating accruals (*OPER_ACC*) is *EARN* minus *CFO*, whereas investing accruals (*INV_ACC*) is *TACC* minus *OPER_ACC*. Variable definitions correspond to those in Richardson et al. (2003). Other accrual-based measures of accounting quality are considered in robustness tests.

[20] As in Richardson et al. (2003), we define a "small positive forecast error" to be cases where the I/B/E/S actual EPS exceeds the last available I/B/E/S consensus EPS forecast by no more than three cents per share. Unadjusted I/B/E/S consensus data are used to mitigate the rounding problems encountered with split-adjusted earnings estimates and actual earnings (Baber and Kang 2002). Richardson et al. (2003) also document a positive association between the probability of restatement and salary mix, defined as the fraction of top executives' total compensation that is equity based. We omit this variable because of data availability constraints. We also omit variables that measure "financing raised" and "*ex ante* financing need" because neither variable is shown to predict future restatements in Richardson et al. (2003).

Three variables (*DAYS_F*, *DAYS_L*, and *FIRST*) capture information about the chronological sequence of restatements in an industry and their time-series proximity. The indicator variable *FIRST* denotes the initial restatement announcement in a series of related restatements (or "episode") involving different firms but the same focus category and industry. *DAYS_F* counts the cumulative number of trading days that have elapsed since the episode's first restatement. *DAYS_L* counts the number of trading days that have elapsed since the last restatement by any firm and regardless of focus category.[21] These variables allow us to establish whether contagion becomes more or less pronounced as more firms in the industry announce similar accounting restatements. We use the completion date of the most recent annual audit (approximated by the fiscal fourth quarter earnings release date plus 20 trading days) to reset the episode counter. This approach presumes that each peer firm's outside auditor responds to a restatement made by another firm in the industry by assessing their client's exposure to the same sort of misstatement and, if a misstatement is discovered, requiring an immediate correction. Episodes are constructed from the original sample of 888 events.

Earnings-based variables use the most recently available quarterly data as of the restatement announcement. We require the data collection quarter to end at least 30 days (45 days for the fourth quarter) prior to the restatement announcement so that investors have timely access to peer firms' quarterly financial statements. Quarterly cash flow data are not readily available on Compustat for financial services firms and utilities, so both economic sectors are deleted from the regression tests even though the results in Table 1 suggests that restatement contagion is present in each sector.

Table 2 reports descriptive statistics for the 13,594 peer firms with available data for our cross-sectional regression tests.[22] The industry-adjusted accounting quality variables (*EARN*, *CFO*, *TACC*, *OPER_ACC*, and *INV_ACC*) exhibit mean values greater than zero, indicating that the peer firms in our sample are more profitable than the average for the GICS industry group. The capital market pressure variables are not industry-adjusted and exhibit mean values comparable to those reported by Richardson et al. (2003). Panel C describes the distributional characteristics of the control variables. The announcement period average abnormal stock return for restating firms (*RESTRET*) is −21.4 percent, and roughly 65 percent of the sample is comprised of initial restatement events (*FIRST*). Peer

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[21] To illustrate, consider three restatements that comprise a single episode. Each restatement is associated with a unique vector of the form (*FIRST*, *DAYS_F*, *DAYS_L*). For example, (1, 0, 67) denotes the first restatement in a focus category/industry episode where some other firm in the industry announced 67 days earlier a restatement involving a different focus category; (0, 25, 25) denotes a second restatement in the same episode that occurs 25 trading days later, and (0, 65, 40) denotes a third restatement that occurs 40 days after the second restatement.

[22] This reduced sample includes 367 (96.6 percent) of the restatement events described in Table 1, and the mean restatement and contagion stock return associated with these events are qualitatively indistinguishable from the mean returns reported in Table 1.

TABLE 2

Descriptive Statistics for 13,594 Non-Restating Peer Firms Included in the Cross-Sectional Regression Analysis of Contagion Stock Returns on Accounting Quality, Capital Market Pressure, and Control Variables

Variable	Mean	Median	25th Percentile	75th Percentile	Standard Deviation
Panel A: Accounting Quality					
EARN	0.060	0.067	0.000	0.165	0.402
CFO	0.044	0.047	−0.024	0.137	0.181
TACC	0.053	0.027	−0.068	0.156	0.422
OPER_ACC	0.015	0.020	−0.034	0.080	0.365
INV_ACC	0.038	−0.002	−0.071	0.104	0.221
Panel B: Capital Market Pressure					
EP	−0.022	0.027	−0.015	0.058	0.386
BM	0.460	0.360	0.192	0.606	0.470
SIZE	5.996	5.849	4.763	6.960	1.656
EPS_GROWTH	0.237	0.000	0.000	0.000	0.425
STRING	0.144	0.000	0.000	0.000	0.351
Panel C: Control Variables					
RESTRET	−0.214	−0.175	−0.303	−0.063	0.183
REVISION	−0.010	0.000	−0.003	0.000	0.218
REST_SIZE	6.375	7.000	4.000	9.000	2.645
FIRST	0.651	1.000	0.000	1.000	0.477
DAYS_F	37.374	0.000	0.000	38.000	79.325
DAYS_L	221.463	61.000	2.000	299.000	348.034
LEV	0.576	0.101	0.000	0.608	4.939

EARN is income before extraordinary items; *CFO* is cash flow from operations; total accruals (*TACC*) is *EARN* minus the sum of *CFO* plus cash flow from investing activities; operating accruals (*OPER_ACC*) is *EARN* minus *CFO*; and investing accruals (*INV_ACC*) is *TACC* minus operating accruals. Earnings, cash flow, and accrual variables are "annualized" by accumulating quarterly amounts over the four fiscal quarters before the restatement announcement. Annualized amounts are then scaled by average assets for the same time period, and industry mean-adjusted using sample means for all Compustat firms in the same GICS industry group. The tabulated mean values for these variables are approximately equal to 0 by construction. Earnings-to-price (*EP*) is "annualized" income from continuing operations divided by equity market value, book-to-market (*BM*) is book value of equity divided by equity market value, and *SIZE* is the natural logarithm of equity market value, all measured at the end of the fiscal quarter preceding the restatement announcement. *EPS-GROWTH* equals 1 if the firm reports consecutive increases in year-over-year quarterly EPS for each of the prior four quarters, and 0 otherwise. *STRING* equals 1 if the firm reports a small positive EPS forecast error (less than 4 cents per share) in each of the prior four quarters, and 0 otherwise. *RESTRET* is the restating firm's three-day abnormal stock return. *REVISION* is the composite change in analysts' consensus one- and two-year-ahead earnings per share forecasts, scaled by share price and measured from the month before the restatement announcement to the month following. *REST_SIZE* is the restating firm's CRSP size decile rank as of the beginning of the calendar year in which the restatement is announced. *FIRST* is an indicator variable that equals 1 for the initial restatement event (as defined in the "Contagion Stock Returns, Accounting Quality, and Capital Market Pressure" sub-section in section IV) in a sequence of restatements involving different firms but the same focus category and industry, and 0 otherwise. *DAY_F* counts the number of trading days that have elapsed since the episode's first restatement. *DAY_L* counts the number of trading days that have elapsed since the last restatement in the industry regardless of focus category. Leverage (*LEV*) is total debt divided by equity book value measured at the end of the fiscal quarter preceding the restatement announcement.

The sample selection procedures used to identify peer (non-restatement) firms are described in Table 1. The number of peer firms in this table is less than that in Table 1 because of data availability limitations and the exclusion of financial services and utility firms from the sample.

firms again exhibit a small decline in analysts' (scaled) annual EPS forecasts after a restatement announcement by another firm in the industry.[23]

The results of our cross-sectional regression tests of the influence of accounting quality and capital market pressure on contagion stock returns are reported in Table 3. Coefficient

TABLE 3

Regression Tests for the Influence of Accounting Quality, Capital Market Pressure, and Control Variables on Contagion Stock Returns

		Model 1	Model 2	Model 3
Intercept		−1.168***	−0.918**	−0.916**
Accounting quality:				
EARN	?	0.189		
CFO	?		1.639***	1.624***
TACC	−		−0.532***	
OPER_ACC	−			−0.569**
INVST_ACC	−			−0.499*
Capital market pressure:				
EP	+	0.702***	1.055***	1.080***
BM	+	0.319**	0.314**	0.317**
SIZE	−	0.066*	0.023	0.023
EPS_GROWTH	−	0.219*	0.180	0.180
STRING	−	0.626***	0.590***	0.590***
Control variables:				
RESTRET	+	−0.224	−0.203	−0.203
REVISION	+	0.355	0.150	0.146
REST_SIZE	−	−0.079***	−0.077***	−0.077***
FIRST	−	0.224	0.248	0.247
DAYS_F	−	−0.003***	−0.003***	−0.003***
DAYS_L	−	−0.001***	−0.001***	−0.001***
LEV	?	−0.046***	−0.044***	−0.044***
YEAR FIXED EFFECTS		Not reported	Not reported	Not reported
Adj. R^2		2.43%	2.70%	2.69%
F-statistic		13.85***	14.76***	14.21***
Sample size		12,890	12,886	12,886

*, **, *** Denotes a statistically significant two-tailed t-test of the null hypothesis that the coefficient estimate is different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

The dependent variable is the size-adjusted buy-and-hold stock return for each non-restating peer firm cumulated over the three trading days centered on the restatement announcement date.

The sample selection procedures used to identify peer (non-restatement) firms are described in Table 1. Variable definitions appear in Table 2. Coefficient estimates for year fixed-effect variables are omitted for brevity. Influential observations with leverage values exceeding 2.0 are eliminated to facilitate estimation of robust regression coefficients (Belsley et al. 1980). Coefficient estimates are multiplied by 100 in the table.

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[23] Untabulated results show statistically significant pair-wise correlations for several explanatory variables. In particular, the accounting quality variables are highly collinear by construction. Cash flow from operations (*CFO*), total accruals (*TACC*), and operating accruals (*OPER_ACC*) are each positively correlated with earnings (*EARN*); while *OPER_ACC* and investing accruals (*INV_ACC*) are both positively correlated with *TACC*. The extent of collinearity present among capital market pressure and control variables is modest in most cases. A notable exception is the large negative Pearson correlation (−0.64) between *FIRST* and *DAYS_F* that occurs because the distribution of *DAYS_F* is censored with values equal to 0 when *FIRST* equals 1.

estimates for the year fixed-effect variables are suppressed for brevity. Influential observations with leverage values exceeding two are deleted to facilitate robust estimation (Belsley et al. 1980).

The data in Table 3 reveal that contagion stock returns are statistically unrelated to the relative profitability of peer firms (*EARN* in Model 1). Contagion stock returns do exhibit a reliably positive association with operating cash flows (*CFO* in Model 2) and a reliably negative association with total accruals (*TACC* in Model 2). As predicted, peer firms with high industry-adjusted total accruals experience a more pronounced contagion stock price decline than do low-accrual firms. On the other hand, peer firms with high industry-adjusted operating cash flows experience a less pronounced contagion stock price decline than do low operating cash flow firms. This means that contagion stock returns reflect investor concern about the relative contribution of operating cash flow and total accruals to reported earnings rather than just a concern about earnings levels. When *TACC* is decomposed into its operating and investing components (Model 3), the resulting coefficient estimates are again reliably negative.

Contagion stock returns exhibit a positive and significant association with three capital market pressure variables: *EP*, *BM*, and *STRING*. This means that peer firms with higher growth expectations (price-to-earnings and book-to-market ratios) and those with a track record for continuous quarterly EPS growth experience a larger contagion share price decline than do peer firms with low growth expectations and no track record. The coefficient estimates for *SIZE* and *EPS_GROWTH* are insignificant except in Model 1.

Table 3 also shows that the coefficient estimates for *REST_SIZE*, *DAYS_F*, *DAYS_L*, and *LEV* are reliably negative. This means that peer firms experience larger contagion stock price declines when a dominant firm in the industry restates, when a substantial amount of time has elapsed since the last restatement in the industry, and when the peer firm is highly leveraged. Peer firms' EPS forecast revisions (*REVISION*), the restating firm's own stock return (*RESTRET*), and whether the restatement is the first in a series of related restatements (*FIRST*) are statistically unrelated to cross-sectional differences in contagion stock returns.[24]

To summarize, the evidence in Table 3 is consistent with the notion that accounting restatements trigger stock price declines among peer firms that in part reflect investors' accounting quality concerns. This conclusion follows from the observation that contagion stock returns are decidedly more negative for peer firms with high accounting accruals and low operating cash flows (i.e., low accounting quality), and high capital market pressure for aggressive accounting choices.[25]

Revenue Restatements versus Expense Restatements

To gain further insight about the circumstances under which accounting quality considerations influence contagion stock returns, Table 4 reports regression results for two restatement groups formed from the GAO focus categories. One group contains 147 revenue recognition restatements and 6,542 peer firms, while the second group is comprised of 174

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[24] The absence of a significant positive *RESTRET* coefficient in Table 3 does not contradict our claim of a contagion price effect. *RESTRET* captures information about both common effects (i.e., those that trigger contagion) and idiosyncratic effects unique to the restatement firm. Our other variables provide a direct measure of the predicted contagion effects and this presumably diminishes the explanatory power of *RESTRET*.

[25] In supplemental tests, we augment the accrual measures in Richardson et al. (2003) using variables that proxy for balance sheet "bloat" (Barton and Simko 2002) and for book-tax differences in accounting practices (Mills and Newberry 2001; Phillips et al. 2003). We find little support for these measures.

TABLE 4
Accounting Focus Category Regression Tests for the Influence of Accounting Quality, Capital Market Pressure, and Control Variables on Contagion Stock Returns

		Revenue Recognition Restatements (147 Events)			Expense Restatements (174 Events)		
		Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Intercept		−1.326**	−0.886	−0.883	−0.451	−0.490	−0.438
Accounting quality:							
EARN	?	0.965**			0.756*		
CFO	?		2.300***	2.262***		1.050**	1.005**
TACC	−		−0.966***			0.497	
OPER_ACC	−			−1.044***			0.346
INVST_ACC	−			−0.896***			0.457
Capital market pressure:							
EP	+	0.647	1.538***	1.606***	2.518***	2.496***	2.557***
BM	+	−0.005	−0.022	−0.010	0.282	0.303*	0.307*
SIZE	−	0.007	−0.041	−0.041	0.089	0.087*	0.081
EPS_GROWTH	−	−0.009	−0.028	−0.028	0.129	0.119	0.128
STRING	−	0.557**	0.551**	0.551**	0.383*	0.381*	0.360
Control variables:							
RESTRET	+	0.002	0.033	0.036	−0.489	−0.472	−0.479
REVISION	+	0.814**	0.862**	0.851**	0.581	0.598	0.622
REST_SIZE	−	−0.154***	−0.154***	−0.153***	−0.064**	−0.063**	−0.064**
FIRST	−	0.868***	0.862***	0.862***	−0.621	−0.613	−0.607
DAYS_F	−	−0.002**	−0.002*	−0.002*	−0.009*	−0.009*	−0.009*
DAYS_L	−	0.000	0.000	0.000	0.000	0.000	0.000
LEV	?	−0.040**	−0.040**	−0.040**	−0.041***	−0.041***	−0.041***
YEAR FIXED EFFECTS		Not reported	Not reported	Not reported	Not reported	Not reported	Not reported
Adj. R^2		3.73%	4.41%	4.40%	2.98%	3.08%	3.00%
F-statistic		11.01***	12.44***	11.97***	7.13***	7.09***	6.72***
Sample size		6,197	6,200	6,200	4,991	4,991	4,991

(*continued on next page*)

TABLE 4 (continued)

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*, **, *** Denotes a statistically significant two-tailed t-test of the null hypothesis that the coefficient estimate is different from zero at the 0.10, 0.05, 0.01 levels, respectively.

Accounting focus categories follow the groupings used in the GAO (2003) study and are described in the Appendix. Expense restatements are those assigned to the GAO categories "Cost and Expense," "Other," and "Restructuring."

The sample selection procedures used to identify peer (non-restatement) firms are described in Table 1. Variable definitions appear in Table 2. Coefficient estimates for year fixed-effect variables are omitted for brevity. Influential observations with leverage values exceeding 2.0 are eliminated to facilitate estimation of robust regression coefficients (Belsley et al. 1980). Coefficient estimates are multiplied by 100 in the table.

expense restatements and 5,249 peer firms.[26] We expect accounting quality contagion to be more pronounced for revenue restatements because the underlying business transactions, accounting practices, and affected financial statement items are more heterogeneous for the expense group.

The key insight from Table 4 is that the accounting quality results in Table 3 are driven by revenue-restating peer firms. Contagion stock returns for these peer firms exhibit a reliably positive association with industry-adjusted profitability (*EARN*) and with operating cash flows (*CFO*), but a reliably negative association with total accruals (*TACC*) and its two components (*OPER_ACC* and *INVST_ACC*).[27] *EARN* and *CFO* coefficients are reliably positive when the sample is restricted to expense restatements, but none of the accrual coefficient estimates are negative and the coefficient on *TACC* is reliably positive.[28]

The results in Table 4 provide contradictory evidence on the influence of capital market pressure variables on contagion stock returns. For example, the *EP* coefficients are statistically significant and in the direction predicted for both revenue and expense restatements. On the other hand, *STRING* remains significant in the opposite direction predicted by Richardson et al. (2003) and none of the other capital market pressure variables exert a detectable influence on contagion stock returns for revenue recognition restatements. The coefficients for *SIZE* and *BM* are reliably positive when the sample is restricted to expense restatements. We have no compelling explanation for differences in capital market pressure across restatement categories.

Several features of the control variable results in Table 4 are noteworthy. Contagion stock returns are statistically more negative when a large firm in the industry restates (*REST_SIZE*) and when other firms in the industry have also announced similar restatements (*DAYS_F*). Third, the coefficients for EPS forecast *REVISION* are reliably positive among revenue restatements but indistinguishable from zero for expense restatements. Revenue restatements may be a more important source of information about declining industry prospects than expense restatements, and thus induce larger and more value relevant EPS forecast revisions among peer firms. Finally, *FIRST* restatements are associated with a less negative contagion stock return in the revenue restatement sample, but have no incremental effect on peer firms' stock returns in the expense restatement sample.[29]

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[26] Expense restatements include those assigned to "Cost and expense," "Restructuring," and "Other" GAO categories. Expense restatements involve corrections to one or more of a myriad of balance sheet items including bad debt or product warranty reserves, inventory, fixed assets, capitalized marketing costs or other intangibles, and operations liabilities as well as off-balance sheet items such as operations leases and pensions. We omit "Merger and acquisition" and "Securities" restatements because they are transaction driven events for which peer firm data about the relevant prior transaction is not readily available in electronic form.

[27] Thirty-eight of the 888 restatements involve accounting mistakes made when implementing the revenue recognition requirements proscribed in Staff Accounting Bulletin (SAB) No. 101 issued by the SEC in 2000. Excluding SAB No. 101 restatements from the regression sample has no discernable impact on the revenue restatement results in Table 4 nor does it alter the results in Table 3.

[28] Rajgopal and Venkatachalam (2005) find that idiosyncratic stock price volatility is statistically associated with abnormal accrual measures. Volatility may function as a correlated omitted variable in the Table 3 and Table 4 regressions. We repeat the analysis including stock price volatility, measured as the standard deviation of peer firm-specific raw returns over a one-year period ending 30 days before the restatement announcement. As expected, the coefficient estimate for volatility is reliably negative in all regressions. Including volatility eliminates the association between contagion stock returns and our measures of accounting quality except when the sample is restricted to revenue restatements by large firms in the industry. For this subsample, the coefficient estimates for *TACC* and *OPER_ACC* remain reliably negative.

[29] We re-estimated our regressions using a Huber-White correction to mitigate the effect of within-firm autocorrelation on our test statistics (Huber 1967; White 1980). As expected, control variables measured at the restatement event level (e.g., *REST_SIZE* or *RESTRET*) become statistically insignificant because the common variance component is large relative to the individual variance component. Some capital market pressure variables lose significance, but our findings about accounting quality are unchanged.

Supplemental Tests

This section describes briefly how the results in Tables 3 and 4 change when: (1) the restating firm and its peers use the same external auditor; (2) the return measurement window is expanded, and (3) the sample is limited to restatements by large firms in the industry.

External Auditor Effects

To investigate whether contagion share price effects are more pronounced when restating and peer firms use the same external auditor, we identify the restating firm's auditor for the fiscal year before the restatement is announced. Approximately 18 percent of the peer firms in our sample use the restating firm's auditor. We augment the regression by inserting a common-auditor indicator variable and also interact it with the accounting quality variables.

We find that contagion stock returns are negatively related to the incremental effects of *CFO* and *OPER_ACC* when peer and restating firms use the same auditor. The negative incremental "same auditor" coefficient for *OPER_ACC* is concentrated in revenue restatements by relatively large firms, while the negative incremental coefficient for *CFO* is concentrated in expense restatements by small firms. The incremental coefficient for *EARN* is also reliably negative in both sample partitions. Investors thus appear to impose an incremental contagion penalty on peer firms with high earnings and high accruals when the peer and restating firm share the same external auditor.

Expanded Returns Window

Restating firms and their peers both experience a pre-announcement stock price decline and post-announcement drift (Table 1). To investigate the possibility that our three-day announcement period returns tests may not capture the full extent of accounting quality contagion, we expand the returns window to 21 trading days (−10 to +10) and repeat the Table 4 regression tests.

Three insights emerge from this analysis. First, the coefficients for accruals (*TACC*, *OPER_ACC*, and *INV_ACC*) remain reliably negative for revenue restatements and the coefficient for operating cash flows (*CFO*) is reliably positive. Second, the coefficient estimates for *EARN*, *TACC*, *OPER_ACC*, and *INV_ACC* become reliably negative for expense restatements. Third, the coefficient estimate for EPS forecast *REVISION* is reliably positive for restatements involving either revenues or expenses. The pattern of results for the remaining variables is largely unchanged. These long-window results thus suggest that accounting quality contagion is present among both revenue and expense restatements.

Dominant Restating Firm

Restatements by large firms induce a greater contagion stock price decline than do restatements by small firms; i.e., the *REST_SIZE* coefficient is reliably negative in Tables 3 and 4. This result suggests that restatements by large firms may also cause investors to become more skeptical about peer firm accounting quality. To investigate this question, we partition the sample according to the restating firm's *SIZE* relative to all restatement and peer firms in the same GICS industry group. Restatements by firms in the bottom tercile are assigned to the "Small Firm" group, while those in the middle and top terciles are assigned to the "Large Firm" group.

The accounting quality coefficient estimates (*TACC*, *OPER_ACC*, and *INV_ACC*) are reliably negative when the sample is restricted to revenue restatements by large firms in the industry. However, these variables are unrelated to contagion stock returns when the sample is restricted to revenue restatements by small firms or expense restatements by small or large firms.

Investor Anticipation of Subsequent Accounting Restatements

This section investigates whether investors respond to the first restatement in an industry by penalizing the share prices of peer firms that later disclose and correct similar accounting misstatements. Evidence that investors partially anticipate later restatements in the same industry would support the joint hypothesis that (1) initial restatements serve as a catalyst for reassessing the accounting quality of peer firms, and (2) investors can correctly predict which peer firms are likely to later restate.

The partial anticipation tests exploit the time-series clustering of restatements by industry and GAO focus category illustrated in Figure 1. We identify the first restatement in each industry/focus category episode using our original sample of 888 restatements. This process yields 643 restatement episodes of one or more restatements involving the same focus category and by firms in the same industry.[30] Of these, 530 episodes (82.4 percent) contain only the one restatement. The other 113 episodes (17.6 percent) contain both an initial and at least one later ("follow-on") restatement.

Industry peer firms are assigned to one of two mutually exclusive groups: peer firms that later restate during the episode (denoted "Restate later"), and those that do not (denoted "Do not restate"). For each group, we compute the three-day mean abnormal stock return associated with the first restatement in the episode. If investors partially anticipate future restatements when the first restatement is announced, then we should observe a larger stock price decline for "Restate later" peer firms than for non-restating peer firms.[31] We also compute the three-day mean return for the restatements announced subsequently by "Restate later" firms.

Table 5 reports the results of the partial anticipation for 340 revenue restatement episodes constructed from our original sample (Panel A) and 148 episodes from the final sample that is the basis for our cross-sectional regression tests (Panel B). The data in both panels show that average share price reaction of "Restate later" peer firms to initial revenue restatements is negative but statistically indistinguishable from zero. Nor do the data suggest that "Restate later" firms experience a smaller share price decline when they subsequently announce their own restatements. Untabulated results for expense restatements are qualitatively similar to those reported in Table 5.

The central message from Table 5 is that we do not find support for the partial anticipation hypothesis.[32] The share prices of firms that subsequently uncover and correct similar accounting misstatements are statistically unaffected, on average, when other firms in the industry first announce a restatement. The apparent failure on the part of investors to correctly anticipate subsequent accounting restatements does not imply market inefficiency because restatements are admittedly difficult to predict (Richardson et al. 2003).

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[30] Consistent with the approach used in constructing the variable *FIRST*, the completion date of the most recent annual audit (approximated by the fiscal fourth quarter earnings release date plus 20 trading days) is used to reset the episode counter.

[31] The test lacks power for detecting contagion-related partial anticipation if relatively innocuous restatements tend to surface first or if the task of forming correct assessments about the likelihood of restatement by an individual firm is exceedingly difficult.

[32] This finding is confirmed by regression test results where we restrict the sample to events with *FIRST* equals 1 and repeat the analysis in Tables 3 and 4.

TABLE 5
Tests for Partial Anticipation Following Revenue Recognition Restatements

	Three-Day Announcement Period Abnormal Stock Returns (%)		
	Restatement Firms (n)	Peer Firms (n)	
		Restate Later	Do Not Restate
Panel A: All Revenue Restatments			
First in the episode	−9.89%***	−1.31%	−0.24%***
	(190)	(83)	(6,893)
Without a follow-on restatement	−9.53%***		−0.20%*
	(129)		(3,791)
With a follow-on restatement	−10.64%***	−1.31%	−0.30%**
	(61)	(83)	(3,102)
Subsequent restatements	−11.99%***		−0.91%***
	(150)		(10,174)
Panel B: Final Revenue Restatement Sample			
First in the episode	−19.95%^{t}	−3.03%	0.01%
	(88)	(36)	(3,168)
Without a follow-on restatement	−18.63%^{t}		−0.34%**
	(60)		(1,588)
With a follow-on restatement	−22.79%^{t}	−3.03%	0.36%*
	(28)	(36)	(1,580)
Subsequent restatements	−23.70%^{t}		−0.77%***
	(60)		(4,337)

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*, **, *** Denotes a statistically significant two-tailed t-test of the null hypothesis that the coefficient estimate is different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

An episode is series of one or more revenue restatements by firms in the same industry. First restatements are those where no earlier revenue restatement has occurred in the industry since completion of firms' most recent annual audit (approximated by the fiscal year end plus 30 trading days). All other restatements are classified as follow-on events because they occur in close proximity to an earlier revenue restatement by a firm in the same industry. A restating firm is classified as "relatively large" if it falls in the top two-thirds of the industry peer firm size distribution based on market capitalization; otherwise, the restating firm is considered "relatively small." The "final" restatement sample is limited to revenue restatements that are not announced as part of a quarterly or annual earnings press release and that give rise to a stock price decline of at least 1.0 percent. The average abnormal stock returns of "final" restating firms are different from zero by construction and denoted with a "t" in the table. Non-restating peer firms are identified using the procedures described in Table 1. Daily abnormal stock returns are size-adjusted using CRSP NYSE/AMEX/NASDAQ market capitalization decile returns. The announcement period is a three-trading-day window centered on the date of the initial restatement-related press release.

V. CONCLUSION

This paper examines whether accounting misstatements discovered at one firm cause capital market participants to reassess the content and quality of financial statements previously issued by other firms in the same industry. We predict and find that accounting restatements that adversely affect shareholder wealth at the restating firm also induce a small but statistically reliable share price decline among non-restating peer firms. This price decline is unrelated to changes in analysts' EPS forecasts, our proxy for restatement-induced changes in investors' expectations about peer firms' future economic prospects. We also predict and find that non-restating firms with high industry-adjusted accruals experience a more pronounced share price decline than do low-accrual peer firms. This accounting contagion effect is concentrated among revenue restatements by relatively large firms in the industry. For these restatements, investors impose a larger contagion penalty on the stock prices of peer firms with high earnings and high accruals when peer and restating firms use the same external auditor. We also find evidence of accrual-related contagion for expense restatements, but only when the stock return event window is expanded to 21 days. The data provide mixed support for the influence of capital market pressures on peer firms' stock returns.

Our results are consistent with the predicted contagion effects of accounting restatements, although not all restatements induce contagion. One recurring message in the data is that revenue restatements by relatively large firms cause investors to reassess the past financial statements of other firms in the industry. This reassessment induces a share price decline among low-quality (i.e., high-accrual) peer firms. However, our data also suggest that this process is noisy because we find no evidence to indicate that investors partially anticipate subsequent restatements by these firms.

There are several caveats to our interpretation of the results. First, the overall explanatory power of the regression model is quite modest. This may reflect noise in our measure of contagion stock returns, limitations of the accounting quality variables, or our reliance on a broad sample of industry peer firms. For example, we have not attempted to control for the possibility that peer firms issue "good" or "bad news" press releases in close proximity to the restatement announcement. Moreover, our accounting quality measures capture information about current (or lagged) accruals in general, rather than accruals specific to the accounting item that is the focus of the restatement.

A second caveat is that we cannot rule out the possibility that the contagion stock returns documented here just reflect restatement-induced changes in expectations about the future economic performance of peer firms. Our tests control for this possibility using analysts' EPS forecast revisions, but the control may be incomplete. Consequently, it is possible that our accrual results are driven by reduced expectations of peer firms' future performance that coincidentally is more pronounced among firms with high industry-adjusted accruals than among low-accrual firms.[33]

A final caveat concerns the out-of-sample generalizability of the study's findings. Our results show clearly that accounting quality contagion is not ubiquitous. Many restatements have no discernable negative impact on restating firms' share prices, a necessary condition for contagion among peer firms. Out-of-sample generalizability is also limited by the changing nature of restatements themselves. Implementation of Sarbanes-Oxley Section 404 internal control evaluations prompted a flood of restatements in 2005 and 2006, many of which corrected classification mistakes or errors in the application of complex GAAP rules. Restatements of this sort have little (if any) impact on the share prices of restating firms, and thus do not induce peer firm contagion.

One intriguing aspect of our results is that financial statement contagion effects are concentrated among revenue recognition restatements. The reason why contagion effects are less prevalent among expense restatement is not entirely clear, although we suspect it is partially due to expense item heterogeneity. A more detailed examination of the revenue and expense restatements, and of the underlying business transactions and accounting practices of peer firms, may shed further light on the circumstances under which contagion occurs. Another avenue for future research is the possibility that some restatements induce "competitive" share price effects of the sort described in footnote 6. Our tests do not examine this possibility.

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[33] In a recent working paper, Durnev and Mangen (2007) also find that the share price decline of competitor firms is larger in industries where competitors have made more inefficient investments in the past, as measured by the marginal Tobin's Q for the industry. Neither their hypotheses nor tests are intended to explain the share price declines of individual peer firms in an industry.

APPENDIX
ACCOUNTING RESTATEMENT CATEGORIES AS DESCRIBED IN THE GAO STUDY

Category	Description
Acquisitions and mergers	Restatements of acquisitions or mergers that were improperly accounted for or not accounted for at all. These include instances in which the wrong accounting method was used or losses or gains related to the acquisition were understated or overstated. This category does not include in-process research and development or restatements for mergers, acquisitions, and discontinued operations when appropriate accounting methods were employed.
Cost or expense	Restatements due to improper cost accounting. This category includes instances of improperly recognizing costs or expenses, improperly capitalizing expenditures, or any other number of mistakes or improprieties that led to misreported costs. It also includes restatements due to improper treatment of tax liabilities, income tax reserves, and other tax-related items.
In-process research and development	Restatements resulting from instances in which improper accounting methodologies were used to value in-process research and development at the time of an acquisition.
Other	Any restatement not covered by the listed categories. Cases included in this category include restatements due to inadequate loan-loss reserves, delinquent loans, loan write-offs, improper accounting for bad loans and restatements due to fraud, and accounting irregularities that were left unspecified.
Reclassifications	Restatements due to improperly classified accounting items. These include restatements due to improprieties such as debt payments being classified as investments.
Related-party transactions	Restatements due to inadequate disclosure or improper accounting of revenues, expenses, debts, or assets involving transactions or relationships with related parties. This category includes those involving special-purpose entities.
Restructuring, assets, or inventory	Restatements due to asset impairment, errors relating to accounting treatment of investments, timing of asset write-downs, goodwill, restructuring activity and inventory valuation, and inventory quantity issues.
Revenue recognition	Restatements due to improper revenue accounting. This category includes instances in which revenue was improperly recognized, questionable revenues were recognized, or any other number of mistakes or improprieties were made [sic] that led to misreported revenue.
Securities-related	Restatements due to improper accounting for derivatives, warrants, stock options, and other convertible securities.

Source: U.S. GAO (2003, 6).

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Commitments and Disclosure in Oligopolies

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ABSTRACT: In this paper, we examine the welfare effects of pre-production commitments made by firms competing in oligopoly markets and disclosure of such commitments. By commitments we refer to any device that provides a strategic incentive to alter production choices. Examples include forward contracts, capital structure, research and development investment, terms of compensation, and cost allocation. If the only purpose underlying commitment is to gain a strategic advantage in product market competition, then the result with disclosure can be characterized by Stackelberg warfare. Many potential commitments have non-strategic effects, implying a trade-off when optimizing, with imperfect achievement of both strategic (deterring rival production) and non-strategic goals. However, given disclosure, we show that in the limit as the number of commitment devices becomes large, firms achieve full Stackelberg warfare and total realization of non-strategic goals. Disclosure in this context is social welfare enhancing.

Keywords: *commitment; disclosure; oligopoly.*

I. INTRODUCTION

There are a plethora of devices available to firms through which they can commit to more aggressive production, influence rival firm behavior, and gain market share in an oligopoly. Commitment devices considered in the economics literature include derivatives (Allaz 1992), R&D investments (Brander and Spencer 1983), capital structure (Brander and Lewis 1986), compensation arrangements (Fershtman and Judd 1987), and cost allocation (Gal-Or 1993). Some devices involve real economic choices; others are choices of accounting policy. These models commonly assume that commitments made in advance of production are observable to rival firms, thereby influencing the latter's production. This feature, along with ubiquitous use and concomitant disclosure of such devices in financial reports, suggests that financial accounting plays an important role in determining product market efficiency. Our purpose in this paper is to consider the effects of commitments such as those above and related disclosure in a unified manner. Extending the existing

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literature, we consider the common properties of individual commitment devices, the impact of disclosing them, the interplay of competing incentives for use of devices, and the synergies that arise from the use of multiple devices.

To date, the accounting literature on disclosure issues in product market settings has principally focused on the role of private information about demand or costs and its revelation.[1] Darrough (1993), in particular, offers a broad perspective on disclosure of private cost and demand information. For the most part, games that have appeared in accounting studies are games with incomplete information about players' "types" rather than games with imperfect information about players' choices at an earlier stage, as in this paper.[2]

While the focus of accounting disclosure standards is on servicing the information needs of capital markets, the literature on information sharing suggests that such standards also impact competition in product markets. This also applies to accounting disclosure standards for commitments considered in this paper. Our findings suggest that disclosure enhances consumer surplus (and often total social welfare). While firms have incentives to disclose commitments voluntarily, we realize that factors outside the scope of our analysis may inhibit voluntary disclosure; e.g., executives of weak governance firms may prefer not to publicly report their compensation, or present stockholders of financially stressed firms may prefer not to publicly reveal debt. Thus, our paper offers a social welfare justification for accounting standards relating to commitments beyond the usual informed investors-capital market efficiency argument.

Consistent with the bulk of the commitment literature, we assume quantity competition (Cournot) at the production stage. This assumption is standard in settings where quantities are long-run choices and prices short-run (Tirole 1988). Kreps and Scheinkman (1983) rationalize quantity competition in a two-stage game with firms first choosing output capacities and then prices.[3] Whenever prices are chosen after quantities, Cournot is the appropriate paradigm. Despite some robustness issues,[4] we find quantity competition a reasonable basis for analysis.

In our basic model, we introduce a first-stage commitment device that serves no purpose besides imparting a strategic advantage in second-stage production; that is, the only effect of the device is to induce more aggressive output that influences rival behavior. Without first-stage commitment, equilibrium is Cournot; with commitment, equilibrium corresponds to Stackelberg warfare.[5] The effect of the commitment device on industry output is pro-competitive that is consumer surplus and social welfare enhancing. Relaxing the assumption that commitments are publicly observable, we show that the absence of disclosure of commitments constructively reduces the game to single-stage Cournot competition, implying neither welfare effects of commitments nor any incentive to engage in commitments.

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[1] See, e.g., Hughes and Kao (1991), Feltham et al. (1992), Hayes and Lundholm (1996), and Pae (2002). Voluntary disclosure studies typically focus on the role of disclosure in the functioning of capital rather than product markets, though in some studies both are considered (e.g., Feltham and Xie 1992; Gigler 1994).

[2] For models in settings where there is incomplete as well as imperfect information see Hughes et al. (2002) and Reis and Stocken (2005).

[3] A classic example of such a setting from Friedman (1983) is automobile manufacturers for which capacities are reset annually while prices adjust to demand in the form of discounts or rebates.

[4] See Gertner (1985), Davidson and Deneckere (1986), and Herk (1993) on various robustness issues regarding Kreps and Scheinkman (1983).

[5] Stackelberg warfare refers to the situation where all firms behave as Stackelberg leaders irrationally conjecturing that rivals will behave as followers. The result is that all firms overproduce relative to the Cournot solution and are worse off as a consequence. Although Stackelberg warfare fails the Nash equilibrium criterion in the standard quantity competition game (only Cournot behavior provides an equilibrium), an equivalent solution is attained as a Nash equilibrium in the two-stage game with commitment followed by production.

Next, we extend the model to encompass both other non-strategic incentives underlying commitments not directly tied to production, per se, and deadweight costs to deviating from commitments that would be optimal in the absence of strategic effects. The presence of other incentives to enter commitments triggers strategic effects even in the absence of disclosure. Disclosure in such settings is still important in elevating these effects. The downside of disclosure is that it incentivizes distortions from otherwise optimal commitments, implying an efficiency loss to counter the social benefit of higher industry output.

Allowing for multiple costly devices, we show that a portfolio of commitments enables firms to approximate a device that serves both strategic and non-strategic goals at negligible cost. Specifically, in the limit, both the full strategic consequences of Stackelberg warfare and the ideal non-strategic goals of the devices are achieved simultaneously, without tradeoffs. Notably, disclosure in this context is of unmitigated social benefit. One can think of commitment devices and their disclosure in this context as an illustration of Adam Smith's "invisible hand" in action. While barriers to entry lead to anti-competitive oligopoly distortions in industry output and resulting loss of social welfare (a "market failure"), our results suggest that the incentives to make and disclose commitments largely negates these costs in effect "letting the market work" as if under free entry. Indeed, our model implies that disclosed commitments undo 64 percent of the social welfare cost of duopoly (with even greater corrective effects in larger oligopolies).

The paper is organized as follows. Section II presents the basic commitment model and examines the consequences of disclosure on strategic behavior. Section III considers the strategic effects of commitments that serve purposes besides influencing production choices. Section IV extends the analysis to multiple commitment devices while Section V concludes.

II. THE BASIC MODEL

Observable Commitments

The industry is composed of two identical, profit-maximizing firms producing a homogenous good.[6] Price is a linear function of industry output and cost is proportional to output. Specifically, in the absence of commitments in advance of production, the profit functions are:

$$\pi_i(q_i, q_j) = (p - c)q_i = (a - c - (q_1 + q_2))q_i; \; i, j \in \{1, 2\}, i \neq j, \tag{1}$$

where p is price, q_1 and q_2 are outputs of Firm 1 and Firm 2, respectively, and a and c are constants (demand and marginal cost, respectively) such that $a > c \geq 0$.

We begin our analysis of pre-production-stage commitments by assuming that such commitments are costless and serve only to influence rival firm output decisions. The nature of commitment is as follows: A firm enters a contract, an activity, or more generally a mechanism of some sort that we will call a "commitment device." The commitment device provides a payoff to the firm, $f_i(q_i)$, contingent on the subsequent choice of output. Because the payoff varies across output levels, the device provides an incremental incentive to the firm to produce beyond the incentive from selling the product itself. The effect of the commitment on the output chosen devolves from changes in the payoff $f_i(q_i)$ as q_i changes, implying that the commitment is itself concomitant with the derivative, $f_i'(q_i)$, referred to as the "commitment level."

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[6] Product differentiation mutes strategic behavior in choosing equilibrium commitments and consequent effects on equilibrium outputs, but does not otherwise alter our results. Details are available from the authors on request.

In short, we augment each firm's profit function to include the commitment payoff:

$$\pi_i(q_i, q_j) = (p - c)q_i = (a - c - (q_1 + q_2))q_i + f_i(q_i);\ i, j \in \{1, 2\},\ i \neq j. \quad (2)$$

The set of feasible payoffs for a device is denoted $F = \{f_i(q_i)\}$. For example, if the device is a forward contract, the firm can choose how many units of output to sell forward at the market price, with a different payoff function for each forward quantity; F includes each such payoff.

We define q_i^* as the equilibrium output choice. To ensure no non-strategic incentive to engage a commitment device, we require $f_i(q_i^*)$ be a constant across alternative device choices; this assumption will be relaxed in Section III. We also assume that it is possible to choose a payoff with any desired derivative (commitment level) at equilibrium output, $f_i' \equiv f_i'(q_i^*)$. In essence, by choosing a commitment level rather than a device, we exploit a transformation of variables from a control variable that distinguishes a commitment device (e.g., a sales commission rate in a compensation contract) to a more convenient construct; the commitment level (how much the firm's payoff increases by producing one more unit). This is especially appealing because it allows simultaneous modeling of all devices with output-varying effects. Our first proposition characterizes the two-stage, commitment-production game, equilibrium:

Proposition 1: Equilibrium production in the commitment-production game corresponds to production under Stackelberg warfare.[7]

From the proof we observe the following equilibrium commitment levels and outputs:

$$f_i' = \frac{1}{5}(a - c);\ i \in \{1, 2\}. \quad (3)$$

$$q_i = \frac{2}{5}(a - c);\ i \in \{1, 2\}. \quad (4)$$

This result is a variation on the Prisoner's Dilemma. Each firm, by its commitment, gains an advantage at the expense of the rival (by spurring its own output and thereby reducing the market price). Since both firms do this, the net effect is to make each firm worse off than in a world without commitments. On the plus side, consumers are able to buy more goods at lower prices. Overall, total social welfare increases, making the commitment effect benign.[8]

Finally, consider the situation in which only one firm can commit. This corresponds to Stackelberg leadership, as the committing firm can assume the role of leader. It can be readily shown that the leader chooses $f' = (1/4)(a - c)$ and $q = (1/2)(a - c)$ while the follower chooses $q = (1/4)(a - c)$. Total output and consumer surplus lies between the cases of no commitments and universal commitments. This will be the case for all subsequent versions of the model throughout the paper, although we will not include the asymmetric case for the sake of brevity.[9]

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[7] The proof of this and all other propositions in the paper are contained in the Appendix.

[8] Total of producer and consumer surplus is $(4/9)(a - c)^2$ in Cournot and $(12/25)(a - c)^2$ in Stackelberg. Stackelberg total surplus is 108% of Cournot surplus. For comparison, total surplus in perfect competition is $1/2(a - c)^2$. These results indicate that disclosed commitments negate 64 percent of the welfare cost of duopoly, $((12/25–4/9)/(1/2–4/9))$. In the context of a three-firm oligopoly, it can be shown that commitments negate 84 percent of the welfare cost of triopoly. Additional firms make commitments even more effective. With disclosed commitments, relatively few firms are required to approximate perfect competition.

Applying the Model

Recalling the transformation of variables described above, Proposition 1 is an incomplete characterization of an equilibrium in that firms actually choose devices such as forward contracts or compensation contracts and related control variable levels such as number of units sold forward or commission rate, not a payoff function as such. For any particular device, the actual choice can be ascertained by identifying a mapping from level of the control variable distinguishing the device to the derivative of the payoff function. Given the optimal derivative from Equation (3), we can invert the mapping to arrive at the optimal control variable level.

An example of a real-world commitment device that may plausibly have the properties we require is a forward contract to buy or sell quantities yet to be produced (Allaz 1992). Let:

$$f_i(q_i) = (p^f - p)q_i^f = ((a - \hat{q}_1 - \hat{q}_2) - (a - q_1 - q_2))q_i^f. \quad (5)$$

The function in Equation (5) represents the profit from a forward contract to sell q_i^f units of output at a price of p^f. At the time of choosing the quantity to be produced, q_i, the forward price is fixed based on the conjectured quantities $\hat{q}_i$; $i \in \{1, 2\}$. Hence:

$$\frac{\partial f_i(q_i)}{\partial q_i} = q_i^f.$$

Furthermore, in equilibrium conjectures are fulfilled implying that the forward price equals the spot price resulting in $f_i(q_i^*) = 0$ at the equilibrium quantities q_i^*. Applying Equation (3), the optimal forward quantity is $(1/5)(a - c)$. Since total output is $(2/5)(a - c)$, this suggests that firms should sell half their output in the forward market and half in the spot market.

A second example involves an agent of the firm who makes the production decision and maximizes his total compensation. Assume, as in Fershtman and Judd (1987), the agent receives compensation based on profits and sales $(\pi_i + \alpha_i pq_i + \theta_i)$. From the agent's perspective, $f_i(q_i) = \alpha_i pq_i + \theta_i$. Since p is a linear function of q_i, f_i is a quadratic function of q_i. It can be shown, based on Equations (3) and (4), that the optimal weight on sales in the compensation function is:

$$\alpha_i = \frac{a - c}{6c - a}, \; c > a/6.$$

Note that θ_i will be chosen such that total compensation equals the agent's reservation wage in equilibrium. Hence, no matter what α_i is chosen, $f_i(q_i^*)$ is a constant.

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[9] Each firm reacts twice as strongly to its own commitment as the other firm does (in the opposite direction). This can be seen in the reaction function in the proof of Proposition 1 in the Appendix (A2). This reaction ratio holds across every version of the model in the paper (see the other proposition proofs). It ensures that any positive commitment necessarily boosts total production and lowers market price (enhancing consumer surplus).

A third example involves cost allocation. Consider a firm with two divisions. Division 1 manufactures and sells the company's product. Division 2 is a service division. Division 1 is organized as a profit center and has the authority to determine the quantity of output produced. Its division manager is compensated on the basis of division profit. Division 2 is a cost center and has no control over output. Central headquarters makes one decision, how to allocate costs to the two divisions. Total unit cost for the firm is c, as before. Headquarters chooses a fraction α_i of this cost to allocate to Division 1 with the remainder allocated to Division 2. Total profit for Firm i is $\pi_i(q_i, q_j) = (p - c)q_i$. Division 1 has profit $\pi_{i1}(q_i, q_j, \alpha_i) = (p - \alpha_i c)q_i$. Division 1 chooses q_i to maximize division profits. Division 1 perceives its costs as lower than they really are and overproduces. This fits our model with $f_i = (1 - \alpha_i)cq$. The optimal cost allocation is:

$$\alpha_i = \frac{6c - a}{5c}, \ a \leq 6c.$$

Transfer prices work similarly. Division 1 manufactures the company's product; Division 2 is a marketing division. Both are organized as profit centers. Division 1 has the authority to determine the quantity of output produced. Part of this production is transferred to Division 2, which sells it to the market. However, Division 1 is free to produce in excess of the transfer amount and sell the excess directly to the market. q_i^t output is transferred from Division 1 to Division 2, with a transfer price of p_i^t. Central headquarters dictates terms of the transfer (both price and quantity). Profits for Division 1 are $\pi_{i1}(q_i, q_j, q_i^t, p_i^t) = (p - c)(q_i - q_i^t) + (p_i^t - c)q_i^t$. Total quantity is chosen by Division 1 and is only price-sensitive for the output in excess of the amount transferred. This is identical to the forward contract scenario. Indeed, Division 1 can be regarded as having sold q_i^t units forward to Division 2. The transfer price creates a lump sum shift in profit from one division to another and thus has no incentive effects. Only the transfer quantity is decision-relevant. The optimal transfer quantity from headquarters' perspective is $q_i^t = (a - c)/5$, as in Equation (3).

Unobservable Commitments

The analysis to this point assumes that commitments are publicly observable. If commitments are unobservable (the nondisclosure case), the game reduces to a single stage with simultaneous play; Cournot is the unique equilibrium.[10] Formally, we have:

Proposition 2: Equilibrium production in the commitment-production game without disclosure of commitments corresponds to the Cournot solution.

The equilibrium commitment levels and production, respectively, are $f_i' = 0$ and:

$$q_i = \frac{1}{3}(a - c); \ i \in \{1, 2\}. \tag{6}$$

Equation (6) corresponds to production in a one-stage noncommitment game (Cournot). An interesting issue from a policymaker's standpoint is whether firms would voluntarily disclose or whether disclosure requirements are needed to further competition. In light of the above, firms have no incentive to commit if they do not also disclose. Suppose one firm does not commit or disclose. The other firm could gain the first-mover advantage by committing and disclosing. It follows that the other firm's best response is to also commit and disclose. Commitment and disclosure go hand in hand; there is no need to mandate disclosure. From the industry's perspective, profits would be higher if disclosure was prohibited; i.e., nondisclosure was mandated. However, such a policy is not socially beneficial and probably not enforceable.

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[10] This result replicates that of Bagwell (1995).

III. OTHER INCENTIVES

Commitments with Disclosure

We now consider incentives to enter commitments besides their effect on rival production and, concomitantly, a cost for deviations from commitments that would be optimal absent strategic effects. Earlier, we required $f_i(q_i^*)$ be constant for any feasible device choice. We now allow devices to have different equilibrium payoffs. We define $\bar{d}$ as the commitment level associated with the device that maximizes $f_i(q_i^*)$. Whatever commitment level the firm chooses, $d_i \equiv f_i'(q_i^*)$, it will pick the device with the highest payoff among all devices with the same d_i. This provides an unambiguous correspondence between the commitment level and the payoff function; thus, there is a well-defined joint quantity-commitment payoff function $g_i(q_i, d_i)$.[11] We assume $g_i(q_i, d_i)$ is concave in the commitment level d_i, implying that deviations from the non-strategic optimum are costlier the greater the deviation. For tractability, we assume a quadratic form:[12]

$$g_i(q_i, d_i) = f_i(q_i)|_{f_i'=d_i} = d_i(q_i - q_i^*) - (d_i - \bar{d})^2 e. \tag{7}$$

e captures a cost of when the commitment deviates from its non-strategic optimum. Deviations from $\bar{d}$ are assumed to be costly regardless of direction. Note that $\bar{d}$ could be negative, implying an anti-competitive effect of non-strategic commitment is possible.

Proposition 3: Given disclosure of commitments:

(A) Commitments will be chosen as follows:

$$d_i = \frac{a - c}{5 + 18e} + \frac{18e\bar{d}}{5 + 18e}, \; i \in \{1, 2\}. \tag{8}$$

Alternatively:

$$d_i = w(e)\frac{a - c}{5} + (1 - w(e))\bar{d}; \; i \in \{1, 2\}, \; w(e) = \frac{5}{5 + 18e}. \tag{9}$$

(B) If commitments are costless to adjust ($e = 0$), then equilibrium commitments are consonant with Stackelberg behavior.

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[11] The use of g_i allows us to suppress the particular institutional nature of a device. Similar to our earlier analysis of purely strategic devices, this functional form involves a transformation of variables from a context-specific device to a generic commitment level. The transformation allows us to derive a general solution that applies universally.

[12] We assume quadratic form for the non-strategic effects since it allows the most elegant mathematical derivation. However, it can be shown that the qualitative results including the limiting cases depend only on concavity.

(C) If the only incentive for entering commitments is strategic ($\bar{d} = 0$), then the level of commitment is decreasing in the cost of adjustment.

Equation (9) shows that the commitment level chosen is a weighted average of the Stackelberg commitment level and the non-strategic commitment level. The conflict between two goals, maximizing strategic advantage and minimizing inefficiency, leads to a compromise, with neither goal met perfectly. Given Equation (9), equilibrium production is:

$$q_i = \frac{2 + 6e}{5 + 18e}(a - c) + \frac{6e\bar{d}}{5 + 18e}, \tag{10}$$

$$q_i = w(e)\left[\frac{2}{5}(a - c)\right] + (1 - w(e))\left[\frac{1}{3}(a - c + \bar{d})\right];\ i \in \{1, 2\}. \tag{11}$$

Equation (11) shows that production is a weighted average of strategic production (Stackelberg) and non-strategic production (Cournot, modified by the incidental output effect of the cost-minimizing commitment level). The following is immediate from Equation (11):

Proposition 4: Given disclosure of commitments:

(A) If commitments are costless to adjust ($e = 0$), then equilibrium production corresponds to Stackelberg warfare.
(B) If commitments are costly to adjust ($e > 0$), then equilibrium production is increasing in the non-strategic incentive to use the commitment device.[13]

As Proposition 3 suggests, there is a pro-competitive effect of the commitment device regardless of its underlying incentives due to strategic use. Proposition 4 notes that on top of this strategic effect, there is an incidental competitive effect (pro or con) driven by the non-strategic use of the device. As is clear from Equation (9), the non-strategic effect boosts the commitment level and thus production if and only if $\bar{d} > (a - c)/5$.

We have demonstrated the limiting cases of infinite costs ($w = 0$ yielding modified Cournot) and no costs ($w = 1$ yielding Stackelberg). To identify which better represents "realistic" cost levels, we consider a numerical example. Assume the commitment is a forward contract. The cost is a percentage commission on the notional value of the contract. The model can be solved by finding the value of e that generates the same marginal cost as the commission in equilibrium. The results are shown in Table 1. A commission of 1 percent is very high, yet even in that case w is 89 percent, so the commitment incentive is very strong. Our results suggest that with reasonable costs, the market outcome is closer to Stackelberg than to Cournot.

Commitments without Disclosure

Consider the same setting without disclosure. Despite not being disclosed, the commitment still has an effect on production since a non-zero value of d_i is chosen. Let $\hat{d}_i$ be

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[13] For part (B), differentiate Equation (11); $\partial q_i / \partial \bar{d} = (1 - w)/3 > 0$.

TABLE 1
Numerical Example of a Costly Forward Contract Commitment

	w	d (as a fraction of $a - c$)	q (as a fraction of $a - c$)
Cournot (benchmark)	0	0	33.3%
Stackelberg (benchmark)	100%	20%	40%
Commission of 0.1%	98.9%	19.8%	39.9%
Commission of 1%	89.1%	17.8%	39.3%
Commission of 2%	77.9%	15.6%	38.5%

These values are derived using Equations (11) and (13). The commissions are expressed as a percentage of notional contract value. $\bar{d} = 0$ and $c = a/2$ are both assumed in applying these equations. It can be readily shown that the equivalent quadratic cost parameter and commitment weight are $e = \frac{3x}{1 - 12x}$ and $w = \frac{5 - 60x}{5 - 6x}$, respectively, where x is the commission rate given in the table. These derivations are available from the authors.

Variable Definitions:
w = weight placed on commitment optimization versus cost minimization;
d = forward contract quantity chosen by each firm;
q = output produced by each firm;
a = market demand parameter; and
c = marginal cost of production.

the other firm's conjecture about each firm's commitment level. Each firm responds to its choice, d_i, while the other firm responds to the conjecture. The following proposition speaks to both equilibrium commitments and production:

Proposition 5: Given nondisclosure:

(A) Commitments and output will be chosen as follows:

$$d_i = \frac{4e\bar{d}}{1 + 4e}, \tag{12}$$

$$d_i = \tilde{w}(e) \cdot 0 + (1 - \tilde{w}(e))\bar{d},\ \tilde{w}(e) = \frac{5}{5 + 20e}, \text{ and} \tag{13}$$

$$q_i = \frac{a - c}{3} + \frac{4e\bar{d}}{3 + 12e} = \tilde{w}(e) \cdot \frac{a - c}{3} + (1 - \tilde{w}(e))\frac{a - c + \bar{d}}{3};\ i \in \{1, 2\}. \tag{14}$$

(B) If either commitments are costless to adjust ($e = 0$), or the only incentive for entering commitments is strategic ($\bar{d} = 0$), then equilibrium production corresponds to Cournot;

(C) If commitments are costly to adjust ($e > 0$) and the non-strategic incentive is positive ($\bar{d} > 0$), then equilibrium production is greater than Cournot.

By Proposition 2, in the absence of disclosure, the strategic commitment level is 0. Thus, the commitment level in Equation (13) is a weighted average of doing nothing (for strategic purposes) and minimizing cost. The weights in Equations (9) and (13) are nearly the same, with the nondisclosure weight being more sensitive to the cost parameter. Equilibrium production is the same as Cournot with an extra term reflecting the incidental non-strategic incentive.

Comparison of Disclosure and Nondisclosure

Finally, we compare disclosure to nondisclosure, assuming that $\bar{d}$ is not extremely high (four times the level that would induce perfect competition):

Proposition 6: Assume that:

$$\bar{d} < (a - c)\frac{4e + 1}{2e}.$$

(A) Commitment choice and production are both greater when commitments are disclosed than not disclosed.
(B) Commitment choice and production are both less sensitive to non-strategic incentives when commitments are disclosed than not disclosed.

The implication of Proposition 6 is that disclosure is beneficial to output (and thus consumer surplus), but at a cost of reducing optimality in the choice of d for non-strategic reasons. The resulting inefficiency could potentially swamp the benefits of competition and provide a justification for public policy that restricts disclosure of information regarding commitment activities, assuming prohibitions on disclosure are enforceable.

Applications with Other Incentives

We now consider a variety of potential commitment devices all of which may have non-strategic incentives for their use. We will discuss how our generic model can be applied to each of these potential devices.

A non-strategic incentive for entering forward contracts is to hedge price risk (in our model, this means that the demand parameter, a, is a random variable). The risk-aversion forward contract case can be modeled as having $\bar{d}$ equal to the forward position that would minimize risk, taking into account the effect of that forward position on output choice. The cost of deviating, e, is proportional to the variance of a. Let a be normally distributed, with mean $\bar{a}$ and variance σ_a^2. Further, let the firm's objective function be mean-variance in profit:

$$E[\pi_i] - \rho Var[\pi_i].^{14}$$

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[14] This is the only departure of our analysis from Hughes and Kao (1997) who assume exponential utility. We choose mean-variance utility to conform to the quadratic cost structure of our general model. As a consequence, our results, while qualitatively similar to Hughes and Kao's (1997), are slightly different.

First consider nondisclosure. Applying Equations (12) and (14), it can be shown that:

$$d_i = (\bar{a} - c)\frac{8\sigma_a^2\rho}{3 + 16\sigma_a^2\rho},$$

$$E[q_i] = (\bar{a} - c)\frac{1 + 8\sigma_a^2\rho}{3 + 16\sigma_a^2\rho}.$$

If there is no risk or risk-neutrality ($\sigma_a^2 = 0$ or $\rho = 0$), then there is no reason to take a forward position so output corresponds to Cournot in expectation.

Now consider disclosure. Applying Equations (8) and (10), it can be shown that:

$$d_i = (\bar{a} - c)\frac{1 + 8\sigma_a^2\rho}{5 + 16\sigma_a^2\rho},$$

$$E[q_i] = (\bar{a} - c)\frac{2 + 8\sigma_a^2\rho}{5 + 16\sigma_a^2\rho}.$$

If there is no risk or risk-neutrality, then Stackelberg production is chosen in expectation.

Next, we extend our earlier example of cost allocations as a commitment device. Assume fraction $\bar{\alpha}$ of costs are controllable by Division 1 and the remainder of costs are controllable by Division 2. In the absence of strategic considerations, $\bar{\alpha}$ fraction of costs would be allocated to Division 1 to align cost-cutting incentives. If α_i is chosen to be any other fraction, then some costs must be mismatched, being allocated to the "wrong" division from a control standpoint. Assuming the least controllable costs are chosen for misallocation first, the deadweight cost of misallocation is likely to be convex in α, with a minimum at $\bar{\alpha}$. Assume that the cost of misallocation is quadratic. Then $d_i = (1 - \alpha_i)c$ as before. The cost function is:

$$\begin{aligned} h(d_i) &= \beta(\alpha_i - \bar{\alpha})^2\, c = \beta((1 - \alpha_i) - (1 - \bar{\alpha}))^2\, c \\ &= \beta(d_i/c - (1 - \bar{\alpha}))^2 \times c = \frac{\beta}{c}(d_i - \bar{d})^2. \end{aligned}$$

Based on Equations (8) and (10), if α_i is disclosed:

$$\alpha_i = \frac{6c - a}{5c + 18\beta} + \frac{18\beta\bar{\alpha}}{5c + 18\beta},$$

$$q_i = \frac{2c + 6\beta}{5c + 18\beta}(a - c) + \frac{6\beta c(1 - \bar{\alpha})}{5c + 18\beta}.$$

Based on Equations (12) and (14), if α_i is not disclosed:

$$\alpha_i = \frac{c + 4\beta\bar{\alpha}}{c + 4\beta},$$

$$q_i = \frac{a - c}{3} + \frac{4\beta c(1 - \bar{\alpha})}{3c + 12\beta}.$$

When misallocations are not a major concern (β is close to zero), these are close to the Stackelberg and Cournot cases respectively (as in Section II). The effect of increasing β depends on how much of the cost should be allocated to each division for efficiency reasons. To illustrate, assume then $a = 2c$. If less (more) than 80 percent of costs should be allocated to Division 1, then β as increases, equilibrium production increases (decreases).

Research and development (R&D) and similar investments are examples of commitment devices directed toward reducing production costs, a non-strategic incentive. A strategic incentive exists to overinvest in these projects (Brander and Spencer 1983). Disclosure of R&D expenditures serves to advance this behavior. An alternative accounting treatment using selective capitalization combined with impairment tests is arguably more informative of the outcomes of R&D investments, enhancing their use as a commitment device.[15] Consistent with this prediction, Horowitz and Kolodny (1980) and Elliot et al. (1984) find R&D spending declined following the imposition of expensing under SFAS No. 2.

IV. MULTIPLE COMMITMENTS

We now allow firms to engage in multiple simultaneous commitments; assume there are n such devices.[16] For simplicity, assume the devices are equally costly to adjust (same e). The non-strategic targets can differ across devices, thus there is a $\bar{d}^1$, $\bar{d}^2$, etc. Let $\bar{d}$ be the total value of the $\bar{d}^k$ s. Firms choose separate values of d_i^k s. Let d_i^K be the total value of the d_i^k s. d_i^K is the cumulative commitment effect of the devices. The results are as follows:

Proposition 7: With disclosure of multiple commitments,

$$d_i^K = w(e/n)\frac{a-c}{5} + (1 - w(e/n))\bar{d}, \tag{9'}$$

$$q_i = w(e/n)\frac{2}{5}(a-c) + (1 - w(e/n))\frac{1}{3}[a - c + \bar{d}];$$
$$i \in \{1, 2\}. \tag{11'}$$

With nondisclosure of multiple commitments,

$$d_i^K = \tilde{w}(e/n)\cdot 0 + (1 - \tilde{w}(e/n))\bar{d}, \tag{13'}$$

$$q_i = \tilde{w}(e/n)\cdot\frac{a-c}{3} + (1 - \tilde{w}(e/n))\frac{a - c + \bar{d}}{3};$$
$$i \in \{1, 2\}. \tag{14'}$$

In the limit of a large number of devices, if the cumulative non-strategic incentive is finite, then:

(A) each individual commitment device is chosen to equal its non-strategic optimum;

(B) given nondisclosure of commitments, equilibrium production corresponds to Cournot; and

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[15] See Hughes and Kao (1994) for demonstration of these effects.

[16] Somewhat analogous to the pro-competitive effects of multiple devices is multiple rounds of commitments considered by Allaz and Vila (1993).

(C) given disclosure, equilibrium production corresponds to Stackelberg warfare.

Note that the Equations (9′), (11′), (13′), and (14′) are identical to Equations (9), (11), (13), and (14) for the one-device case, but the weight is a function of the cost parameter divided by the number of devices. This is because the use of many devices allows smaller deviations from each one's non-strategic optimum, effectively lowering the *marginal* cost of each device (since the cost function is convex). As the number of devices increases, the weight on strategic use increases ($\lim_{n\to\infty} w = \lim_{n\to\infty} \tilde{w} = 1$), eliminating the distortion caused by the non-strategic motive.

In the nondisclosure case, implicit strategic effects of non-strategic commitments with nonzero optimal levels will tend to mitigate their use causing costly distortions from optimal levels sans those effects. Firms can remedy this problem by fully committing to the optimal levels for meeting non-strategic goals and undoing the effect of those commitments by entering into commitments that serve no non-strategic goals (and thus do not increase $\tilde{d}$). Hence, the availability of many commitment devices with no incentives is sufficient to restore Cournot competition. With disclosure, the tendency to distort commitments serving non-strategic goals for strategic purposes is dampened by the availability of commitments that serve no non-strategic goals; with many such devices Stackelberg warfare seems unavoidable.

The assumption in the second part of Proposition 7 does not seem severe. There are many devices that can be used as commitments. Some of these have positive non-strategic goals behind their use, but many involve no non-strategic incentives or even negative incentives. It seems reasonable that the total set of devices does not impose infinite incentive pressure on production. Finally, Proposition 7's limit findings can be obtained with a finite number of costly devices if there also exists just one costless device with no non-strategic incentive.

Proposition 7 is striking. Part (A) demonstrates that the prospect of using a device to commit production does not imply distortion from non-strategic goals, in contrast to the one-device findings in Proposition 6. Parts (B) and (C) show that the presence of non-strategic motives has no effect on the commitment level obtained. The only relevant factor is disclosure policy. The upshot of Proposition 7 is that disclosure provides an unmitigated social benefit when many commitments exist, in contrast to the case of one device where disclosure could have an adverse effect on overall economic efficiency. Table 2 summarizes our results for both the commitment level (d) and the output quantity (q), under various circumstances.

V. CONCLUSION

This paper considers the effects of commitments and their disclosure on product market competition. Competing firms have incentive to use commitment devices to achieve a strategic advantage in later production. Analogous to a Prisoner's Dilemma, the usual consequence of such behavior in symmetric cases where all competing firms have access to commitment devices is Stackelberg warfare with the pro-competitive result that firms are worse off by comparison to Cournot, consumers are better off, and social welfare is higher. Our results imply that a wide variety of commitment devices can fill this rôle and that they work in fundamentally the same way. However, much depends on the presumption that commitments are publicly observable.

If commitments serve no other purpose than to gain a strategic advantage, then failure to disclose those commitments undoes their effects. If disclosure is voluntary, then generally

TABLE 2
Summary of Analytical Results

	No Disclosure	Disclosure
Panel A: Commitment Level (d_i^K)		
Cournot (benchmark)	0	
Stackelberg (benchmark)	$\frac{a-c}{5}$	
Finite costly devices	$\tilde{w} \cdot 0 + (1-\tilde{w})\bar{d}$ $\tilde{w} = \frac{5}{5+20(e/n)}$	$w\frac{a-c}{5} + (1-w)\bar{d}$ $w = \frac{5}{5+18(e/n)}$
Costless devices or infinite costly devices ($w = \tilde{w} = 1$)	0	$\frac{a-c}{5}$
Panel B: Production Level (q)		
Cournot (benchmark)	$\frac{a-c}{3}$	
Stackelberg (benchmark)	$\frac{2}{5}(a-c)$	
Finite costly devices	$\frac{a-c}{3} + (1-\tilde{w})\frac{\bar{d}}{3}$	$w\left[\frac{2}{5}(a-c)\right] + (1-w)\frac{a-c+\bar{d}}{3}$
Costless devices or infinite costly devices ($w = \tilde{w} = 1$)	$\frac{a-c}{3}$	$\frac{2}{5}(a-c)$

Variable Definitions:
w = weight placed on commitment optimization versus cost minimization (disclosure case);
$\tilde{w}$ = weight placed on commitment optimization versus cost minimization (nondisclosure);
a = market demand parameter;
c = marginal cost of production;
$\bar{d}$ = cost-minimizing commitment level (in aggregate);
e = cost of deviating from the cost-minimizing commitment level; and
n = number of commitment devices available to each firm.

disclosure will occur in equilibrium as each firm fruitlessly seeks to be a first mover. Given the plethora of commitment devices available and the difficulty of enforcing prohibitions on disclosure, Stackelberg warfare would often appear to be a natural state of affairs.

The result that disclosure of commitments is good for society, but bad for oligopolies, may have important implications for accounting policy development. For example, this might explain executives' resistance to financial reporting standards (SFAS No. 133) requiring disclosure of forward positions. However, given incentives to voluntarily disclose, there must be another force at work for firms to self-select nondisclosure. One likely candidate is the desire to avoid indirectly revealing private information.[17] Such a concern was expressed by the Treasury Management Association's chairman in summarizing a survey among 300 members[18] in opposing this standard prior to its adoption. Plausibly, in this case, mandated disclosure contributes to pro-competitive strategic behavior.

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[17] See Hughes et al. (2002) for an analysis of the trade-offs involved.

Commitments with strategic implications such as forward contracts, debt contracts, compensation contracts, R&D and other investments, and cost allocations may be implemented for a variety of other purposes, what we termed non-strategic incentives. Disclosure in the presence of non-strategic incentives involves a trade-off between the effects of disclosure in strengthening strategic incentives and inducing distortions from optimal non-strategic commitments. The former effects are socially beneficial in furthering pro-competitive output decisions, while the latter may be socially harmful in the sense of efficiency losses.

The simultaneous presence of many commitment devices suggests firms may be able to gain the full strategic effects of a costless device even when commitments are costly, by using each device to achieve partial strategic effects. Recourse to a portfolio of devices also allows the firm to reduce the distortion to each device wrought by its strategic effects, thereby optimizing every margin simultaneously, but still implementing pro-competitive production.

Relating the analysis to the real world is not a simple matter. Our multi-commitment model suggests we would expect evidence of strategic use to be faint on any single commitment device. A more promising holistic approach would be an industry-level assessment of (1) the effects of mandated disclosure and (2) the level of competitiveness induced by commitments. With mandated disclosure there is little prospect for detecting cross-sectional effects, so a natural direction is an event study involving adoption of standards that expand disclosure. The major challenge in (2) is how to quantify competitiveness. In industrial organization studies, this is done by measuring the sensitivity of prices to quantities (Bresnahan 1989). Such a measure has been empirically estimated in an oligopoly setting for the sugar refining industry (Genesove and Mullin 1998). They find that even in years of the sugar cartel the market was closer to perfect competition than expected given the degree of industry concentration. While they could offer no explanation, our results suggest that commitments and their disclosure may have played a role. As we have shown, disclosed commitments offer a seemingly inevitable market response to the distortions of oligopoly, eliminating most of its costs and resulting in approximate perfect competition with relatively few firms.

APPENDIX
PROOFS OF PROPOSITIONS

Proof of Proposition 1

We solve the two-stage game by backward induction. Differentiating profit from Equation (2) with respect to output for both firms and setting the results equal to zero leads to the following second-stage reaction functions for given first-stage choices of f_i', $i \in \{1, 2\}$:

$$q_i = \frac{a - c - q_j + f_i'}{2}; \; i, j \in \{1, 2\}, i \neq j. \tag{A1}$$

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[18] Feltham et al. (1992) point out similar concerns about revelation of proprietary information expressed in comments to a discussion memorandum preceding SFAS No. 14 by opponents of segment reporting; a reporting alternative that as mentioned in Section II may involve cost allocations as commitment devices.

Solving (A1) for outputs yields:

$$q_i = \frac{a - c - f_j' + 2f_i'}{3}; \; i, j \in \{1, 2\}, i \neq j. \tag{A2}$$

Stepping back to the first-stage choice of f_i', substitute for outputs (A2) in Equation (2):

$$\pi_i = \left(a - c - \left(\frac{a - c - f_i' + 2f_j'}{3} + \frac{a - c - f_j' + 2f_i'}{3}\right)\right)\frac{a - c - f_j' + 2f_i'}{3}$$
$$+ f_i(q_i^*),$$
$$\pi_i = \frac{1}{9}(a - c - f_i' - f_j')(a - c - f_j' + 2f_i') + f_i(q_i^*); \; i, j \in \{1, 2\}. \tag{A3}$$

Recall that by assumption, $f_i(q_i^*)$ is a constant. This implies that no matter what f_i' is chosen, the payoff of the device at the anticipated equilibrium output is the same. Taking the first-order condition from (A3) for the commitment level choice, that term drops out:

$$\frac{d\pi_i}{d(f_i')} = \frac{1}{9}[2(a - c - f_i' - f_j') - (a - c - f_j' + 2f_i')] = 0; \; i, j \in \{1, 2\}. \tag{A4}$$

By symmetry, it is clear that $f_i' = f_j'$ in equilibrium. This leads to the following:

$$f_i' = \frac{1}{5}(a - c); \; i \in \{1, 2\}. \tag{A5}$$

Substituting from (A5) into (A2) leads to equilibrium production of:

$$q_i = \frac{2}{5}(a - c); \; i \in \{1, 2\}. \tag{A6}$$

This is the same output level as in the standard disequilibrium Stackelberg warfare model (see Intriligator [1971, 210] for a concise derivation of (A6) employing conjectural variations).

Proof of Proposition 2

Replace f_j' with the conjecture $\hat{f}_j'$ in (A2) since the actual f_j' is unknown. (A3) becomes:

$$\pi_i = \frac{1}{9}(a - c - 2f_i' + \hat{f}_i' - \hat{f}_j')(a - c - \hat{f}_j' + 2f_i')$$
$$+ f_i(q_i^*); \; i, j \in \{1, 2\}. \tag{A7}$$

The first-order condition is:

$$\frac{d\pi_i}{d(f_i')} = \frac{1}{9}[-8f_i' - 2\hat{f}_i'] = 0 \tag{A8}$$

which can only be true if $f_i' = \hat{f}_i' = 0$, $i = 1, 2$. Substituting that into (A2) yields:

$$q_i = \frac{1}{3}(a - c);\ i \in \{1, 2\}. \tag{A9}$$

Proof of Proposition 3

The same two-stage optimization is done as for Proposition 1. The second-stage is identical, resulting in (A2) with $f_i' = d_i$. The first stage optimization proceeds as follows:

$$\pi_i = (a - c - (q_1^* + q_2^*))q_i + g_i(d_i, q_i^*),$$

$$\pi_i = \frac{a - c - f_j' - d_i}{3}\,\frac{a - c - f_j' + 2d_i}{3} - e(d_i - \bar{d})^2,$$

$$\frac{\partial \pi_i}{\partial d_i} = \frac{a - c - f_j' - 4d_i}{9} - 2e(d_i - \bar{d});\ i, j \in \{1, 2\}.$$

Setting the above derivative equal to zero gives the optimal commitment level:

$$d_i = \frac{a - c}{5 + 18e} + \frac{18e\bar{d}}{5 + 18e},\ i \in \{1, 2\}. \tag{A10}$$

Alternatively, (A10) can be stated as:

$$d_i = w(e)\frac{a - c}{5} + (1 - w(e))\bar{d};\ i \in \{1, 2\},\ w(e) = \frac{5}{5 + 18e}. \tag{A11}$$

From (A11), parts (B) and (C) are immediate, given the relationship between the weight and the cost parameter.

Equilibrium output depicted in the body following the proposition is included here for later comparisons:

$$q_i = \frac{2 + 6e}{5 + 18e}(a - c) + \frac{6e\bar{d}}{5 + 18e};\ i \in \{1, 2\}. \tag{A12}$$

Alternatively:

$$q_i = w(e)\left[\frac{2}{5}(a - c)\right] + (1 - w(e))\left[\frac{1}{3}(a - c + \bar{d})\right];\ i \in \{1, 2\}. \tag{A13}$$

Proof of Proposition 5

The same analysis is done as before, but using the conjectures for the commitments:

$$\pi_i(q_i, q_j) = (a - c - (q_1 + q_2))q_i + f_i(q_i),$$

$$\pi_i = \frac{2(a-c) - 2\hat{d}_j + \hat{d}_i - 3d_i}{6}\,\frac{2(a-c) - 2\hat{d}_j + \hat{d}_i + 3d_i}{6} - e(d_i - \bar{d})^2,$$

$$\frac{\partial \pi_i}{\partial d_i} = \frac{-d_i}{2} - 2e(d_i - \bar{d}),$$

$$d_i = \frac{4e\bar{d}}{1 + 4e}, \tag{A14}$$

$$d_i = \tilde{w}(e) \cdot 0 + (1 - \tilde{w}(e))\bar{d};\ i \in \{1, 2\},\ \tilde{w}(e) = \frac{5}{5 + 20e}. \tag{A15}$$

Substituting this into (A2) yields equilibrium production:

$$q_i = \frac{a - c}{3} + \frac{4e\bar{d}}{3 + 12e}, \tag{A16}$$

$$q_i = \tilde{w}(e) \cdot \frac{a - c}{3} + (1 - \tilde{w}(e))\,\frac{a - c + \bar{d}}{3};\ i \in \{1, 2\}. \tag{A17}$$

From (A14), parts (B) and (C) are immediate.

Proof of Proposition 6

These results follow from comparing (A10) to (A14) and (A12) to (A16).

(A) It can be readily seen that the values in (A10) and (A12) are larger than (A14) and (A16), respectively, when $\bar{d} < (a - c)\,\frac{4e + 1}{2e}$. For example:

$$d_i(disc) - d_i(non) = \left(\frac{a - c}{5 + 18e} + \frac{18e\bar{d}}{5 + 18e}\right) - \frac{4e\bar{d}}{1 + 4e}$$

$$= \frac{a - c}{5 + 18e} - \frac{2e\bar{d}}{(5 + 18e)(1 + 4e)},$$

$$d_i(disc) - d_i(non) = \frac{2e}{(5 + 18e)(1 + 4e)}\left(\frac{1 + 4e}{2e}(a - c) - \bar{d}\right) > 0;$$

$$i \in \{1, 2\}.$$

(B) The coefficient on $\bar{d}$ is smaller in (A10) and (A12) than in (A14) and (A16), respectively.

Proof of Proposition 7

First consider nondisclosure. Each firm conjectures that the other firm will choose an overall commitment level of d_i^K. The first-period optimization problem is:

$$\pi_i(q_i, q_j) = (a - c - (q_1 + q_2))q_i + f_i(q_i),$$

$$\pi_i = \frac{2(a - c) - 2d_j^K + d_i^K - 3\sum_{k=1}^{n} d_i^k}{6} \, \frac{2(a - c) - 2d_j^K + d_i^K + 3\sum_{k=1}^{n} d_i^k}{6}$$

$$- e\sum_{k=1}^{n} (d_i^k - \bar{d}^k)^2,$$

$$\frac{\partial \pi_i}{\partial d_i^k} = \frac{-d_i^K}{2} - 2e(d_i^k - \bar{d}^k);\ i \in \{1, 2\}.$$

Setting the above derivative equal to zero, we obtain:

$$d_i^k = \bar{d}^k - \frac{d_i^K}{4e},\ i \in \{1, 2\},\ k \in \{1, 2, \ldots, n\}. \tag{A18}$$

This is not a reduced form characterization, so we sum (A18) across all k and take the limit with respect to the number of commitment devices:

$$d_i^K = \sum_{k=1}^{n} d_i^k = \sum_{k=1}^{n} \bar{d}^k - \frac{nd_i^K}{4e} = \bar{d} - \frac{nd_i^K}{4e},$$

$$d_i^K = \frac{4e}{4e + n}\bar{d}, \tag{A19}$$

$$\lim_{n\to\infty} d_i^K = 0;\ i \in \{1, 2\}.$$

The limit in (A10) is valid if $\bar{d}$ remains finite. As the number of devices increases, each device is used less and less on average. As in the one-device case, (A19) can be expressed as a weighted average of the strategic and non-strategic motives:

$$d_i^K = \tilde{w}(e/n) \cdot 0 + (1 - \tilde{w}(e/n))\bar{d};\ i \in \{1, 2\}. \tag{A20}$$

The equilibrium production levels for the nondisclosure case for a finite and an infinite number of commitment devices are, respectively:

$$q_i = \frac{a - c}{3} + \frac{4e}{3n + 12e}\bar{d},$$

$$\lim_{n\to\infty} q_i = \frac{a - c}{3};\ i \in \{1, 2\}. \tag{A21}$$

By substituting the weight formula into (A21), we obtain:

$$q_i = \tilde{w}(e/n) \cdot \frac{a - c}{3} + (1 - \tilde{w}(e/n))\,\frac{a - c + \bar{d}}{3};\ i \in \{1, 2\}. \tag{A22}$$

Next, we consider disclosure of the commitment devices:

$$\pi_i(q_i, q_j) = (a - c - (q_1 + q_2))q_i + f_i(q_i),$$

$$\pi_i = \frac{a - c - d_j^K - \sum_{k=1}^{n} d_i^K}{3} \, \frac{a - c - d_j^K + 2\sum_{k=1}^{n} d_i^k}{3} - e\sum_{k=1}^{n}(d_i^k - \bar{d}^k)^2,$$

$$\frac{\partial \pi_i}{\partial d_i^k} = \frac{a - c - d_j^K - 4d_i^K}{9} - 2e(d_i^k - \bar{d}^k);\ i \in \{1, 2\}.$$

Setting the above derivative equal to zero, we obtain:

$$d_i^k = \bar{d}^k + \frac{a - c - 5d_i^K}{18e},\ i \in \{1, 2\},\ k \in \{1, 2, \ldots, n\}. \tag{A23}$$

Summing (A23) across all *k*:

$$d_i^K = \sum_{k=1}^{n} d_i^k = \bar{d} + n\,\frac{a - c - 5d_i^K}{18e},$$

$$d_i^K = \frac{n}{18e + 5n}\left(a - c + \frac{18e}{n}\bar{d}\right),$$

$$\lim_{n \to \infty} d_i^K = \frac{1}{5}(a - c);\ i \in \{1, 2\}. \tag{A24}$$

Restating (A24) in weighted form yields:

$$d_i^K = w(e/n)\,\frac{a - c}{5} + (1 - w(e/n))\bar{d});\ i \in \{1, 2\}. \tag{A25}$$

The equilibrium production levels in the finite and infinite cases are, respectively:

$$q_i = \frac{2n + 6e}{5n + 18e}(a - c) + \frac{6e}{5n + 18e}\bar{d},$$

$$\lim_{n \to \infty} q_i = \frac{2}{5}(a - c),$$

$$q_i = w\,\frac{2}{5}(a - c) + (1 - w)\,\frac{1}{3}[a - c + \bar{d}];\ i \in \{1, 2\}. \tag{A26}$$

Proof of (A): For the disclosure case, substitute the limit of (A24) into (A23):

$$d_i^k = \bar{d}^k + \frac{a - c - 5\left[\frac{1}{5}(a - c)\right]}{18e} = \bar{d}^k, i \in \{1, 2\}, k \in \{1, 2,\ldots,n\}.$$

For the nondisclosure case, a similar result is obtained from substituting the limit of (A19) into (A18).

(B) Follows from (A19).
(C) Follows from (A23).

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Do Effects of Client Preference on Accounting Professionals' Information Search and Subsequent Judgments Persist with High Practice Risk?

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ABSTRACT: Prior research indicates that audit and tax professionals' judgments are influenced by their client's preferences, both directly and indirectly (via information search). In an experiment with tax professionals as participants, we examine whether high practice risk (i.e., exposure to monetary and nonmonetary costs of making inappropriate recommendations) mitigates these effects. We find that, when facing a client with low practice risk, professionals' search is biased in a manner that leads judgments to be consistent with client preference; however, search is less biased when facing a client with high practice risk, and resulting judgments are less consistent with client preference. We also find that, after controlling for the impact of information search, professionals tend to adjust their recommendations away from the client-preferred position, regardless of practice risk. This study sheds light on the direct and indirect paths by which client preference and practice risk affect professionals' judgments.

Keywords: *confirmation bias; information search; practice risk; path analysis.*

Data Availability: *Data are available from the authors on request.*

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I. INTRODUCTION

Accounting professionals must balance a desire to serve and retain clients with a desire to follow professional standards and manage the risk associated with making inappropriate judgments (Farmer et al. 1987; Nelson 2003). As evidence of professionals' desire to please clients, research shows that client preference *directly* influences accounting professionals' judgments. That is, audit and tax professionals tend to resolve issues consistent with client preference, given sufficient ambiguity (Johnson 1993; Trompeter 1994; Cuccia et al. 1995; Hackenbrack and Nelson 1996; Salterio and Koonce 1997; Kadous et al. 2003). Client preference also *indirectly* influences professionals' judgments by affecting their information processing. In particular, client preference affects professionals' information search such that search emphasizes information that supports the client's preferred position (positive information) at the expense of information that contradicts that position (negative information), and this confirmation bias leads professionals to make biased judgments about the support for the client's preferred position and aggressive recommendations to clients (Cloyd and Spilker 1999).[1]

When professionals' decision processes are inappropriately influenced by client preference, professionals are particularly vulnerable to practice risk, which is exposure to potential costs of making inappropriate recommendations. These costs include monetary costs such as those of malpractice litigation and nonmonetary costs such as loss of reputation (Kadous and Magro 2001). Practice risk varies with client characteristics (Fiore 1998; Kahan 1996) and with features of the decision environment. Practice risk is higher when the client has features that increase the likelihood of regulatory challenge or of malpractice litigation and when the environment is characterized by larger penalties or higher likelihood of penalty imposition.

The purpose of this paper is to examine whether practice risk reduces the direct and indirect (through information search) effects of client preference on accounting professionals' recommendations. Of primary importance is whether professionals adapt to high-risk situations by performing more balanced information search or whether confirmatory tendencies persist in high-risk situations, where they are likely to be particularly costly. While prior research indicates that professionals can avoid the direct effects of client preference in risky situations (Farmer et al. 1987; Hackenbrack and Nelson 1996), indirect effects are more likely to persist. This is because the professional convinces herself, through a biased search, that the inappropriate judgment is adequately supported. Thus, the professional overestimates the support for the client-preferred position and unknowingly recommends an inappropriately aggressive position despite environmental or client-based risk factors.[2]

We address the research question in a web-based experiment in which 63 tax professionals searched a database of judicial precedents to resolve an ambiguous client issue. Information search of tax authorities has long been an important aspect of tax professionals' responsibilities, and it is critical to the quality of recommendations to clients about what positions to take on returns and how to structure future transactions. With the recent issuance of FIN No. 48, tax professionals' information search takes on increased significance (FASB 2006; AICPA 2006). Because tax positions are reflected in financial statements, FIN No. 48 requires an evaluation of the sustainability of all uncertain tax positions for financial reporting purposes. It calls for an assessment of the likelihood of sustaining a position on its technical merits assuming full knowledge of all relevant information. FIN No. 48 thus makes salient that tax professionals' ability to search for and evaluate tax authorities in an unbiased manner is critical to the quality of the financial statements.

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[1] Consistent with prior literature (e.g., Cloyd and Spilker 1999; Jonas et al. 2001), we use the term "confirmation bias" to indicate a search that focuses on information that supports, rather than contradicts, the pre-selected alternative.

[2] Nelson (2005) notes that indirect effects of incentives on professionals' decision processes are likely unconscious. If professionals are unaware of the bias, then they are unlikely to undertake conscious efforts to avoid it.

In our study, professionals considered whether a taxpayer should be treated as an investor or a dealer for reporting a series of real estate transactions. After conducting information search, they assessed the strength of evidential support for the client's preferred position and indicated the strength with which they would recommend that position. We manipulated practice risk and client preference between participants. Following prior research, we manipulated practice risk through client characteristics, including a history of engaging tax practitioners or others in litigation (Kadous and Magro 2001). We manipulated client preference through the result of the transactions: when the transactions resulted in gains, the client prefers investor treatment, but when the transactions resulted in losses, the client prefers dealer treatment.

Consistent with prior research (Cloyd and Spilker 1999), we observe indirect effects of client preference on recommendations for low-risk clients. That is, professionals advising a low-practice-risk client emphasize positive over negative precedents in their information search, despite the fact that the positive precedents are no more relevant to the client's situation than the negative precedents. That biased search influences professionals' judgments, including their recommendations to clients. We extend prior research by demonstrating that practice risk significantly reduces these effects. Professionals advising a high-practice-risk client perform a more balanced search, which results in more objective judgments about the authoritative support for the client-preferred position and less aggressive recommendations to clients.

Results with respect to the direct effect of client preference on recommendations are not consistent with expectations. In contrast to prior research finding a *positive* direct effect of client preference on accounting professionals' recommendations (Cloyd and Spilker 1999), we observe a *negative* direct effect of the client's preferred position on the professionals' recommendations. That is, controlling for the indirect effect of practice risk on recommendations through information search, professionals adjust their recommendations *away* from the client's preferred position, regardless of the level of practice risk. While we cannot specifically test the reason for the different results across the studies, it is worth noting that in the early 2000s, environmental practice risk increased with heightened governmental regulation and oversight designed to curb aggressive advice to clients in both audit (e.g., McDonnell 2004) and tax (e.g., Lipton 2003; Muler and Katz 2003; Chassman and Brennan 2005) contexts. In 2003, tax directors at three international accounting firms testified before Congress that from 2000 to 2003 their firms had significantly restructured their tax practices in response to increased risk in the regulatory environment (Berry 2003; Weinberger 2003; Weisner 2003), demonstrating that accounting firms are sensitive to these changes. Thus, our participants' reluctance to recommend the client-preferred position may be a reaction to an increase in environmental practice risk since 1999.

This study contributes to the accounting literature by providing theory and evidence about the mechanisms by which client preference effects occur. It also contributes by demonstrating that professionals are able to overcome confirmation bias in high-risk situations. They adapt to a high-risk setting by conducting a more balanced search for information. Additional analysis confirms that professionals are more strongly committed to the goal of identifying the position that is best supported by the relevant authority for the high-risk client. Thus, it appears that professionals in both the high- and low-practice-risk conditions conducted motivated search; however, those with a high-risk client were motivated to identify the position with the most authoritative support, rather than to confirm the client-preferred position.

This study contributes to theory and practice by identifying a condition in the public accounting environment that impacts the size of confirmation bias. Our finding that confirmation bias is significantly reduced for high-risk clients is important because prior research both within accounting and in the broader judgment and decision-making literature indicates that confirmation bias is ubiquitous and difficult to eliminate. While we do not suggest that accounting professionals should seek out high-risk clients in order to improve their decision processes, we believe that researchers and practitioners will find it interesting that confirmation bias observed in low-risk settings does not generalize to high-risk settings, where it would be of most concern.

Finally, this study makes an additional contribution by replicating the Cloyd and Spilker (1999) results in a new regulatory environment. To the extent that recent increases in environmental practice risk are salient, they may motivate professionals to make more conservative judgments. Consistent with this reasoning, the direct effect of client preference on recommendations is negative in our study. Nevertheless, we find that confirmation bias persists, even in the new regulatory environment, for low-practice-risk clients.

While this study was conducted in a tax context, our theory is more general and we expect similar results would obtain in other settings in which professionals have incentives to satisfy a client with a known preference and must perform information search to assess the appropriateness of that preference. Auditors, for example, increasingly rely on large databases to assess the appropriateness of reporting methods, highlighting a need for research into the impact of selective information search among auditors (Trotman 2005).

The remainder of the paper proceeds as follows. Section II provides theory and develops the hypotheses. Section III describes the research method, Section IV presents the results, and Section V discusses the results and concludes the paper.

II. THEORY

Accounting professionals tend to make recommendations that are consistent with their clients' preference, even when that preference is aggressive (see Nelson [2003] for a review). For example, Schisler (1994) finds that tax professionals make more aggressive recommendations to clients that prefer aggressive positions, especially when the client is in a tax due situation (and thus the preference for the aggressive position is heightened). Cloyd and Spilker (1999) find that tax professionals' recommendations are consistent with client preference even to the point of being inappropriately aggressive. Hackenbrack and Nelson (1996) find that when practice risk is moderate (as opposed to high), auditors allow clients to use their preferred accounting method, even when it is aggressive. Kadous et al. (2003) show that auditors are more likely to identify the client-preferred aggressive reporting method as the best possible reporting method when the client's desire to use that method is high.

This evidence is consistent with accounting professionals engaging in motivated reasoning in favor of the client's preferred position. Motivated reasoning occurs when an individual has a preferred conclusion and engages in decision processes that make it more likely he will reach that conclusion, given sufficient ambiguity about what is acceptable (i.e., Kunda 1990, 1999). One important process by which this goal is achieved is biased information search (Pyszczynski and Greenberg 1987; Kunda 1999).

Cloyd and Spilker (1999) provide a model of client preference effects in a setting in which accounting professionals must engage in research before making a recommendation to a client. They demonstrate that client preference impacts professionals' recommendations via two routes. First, professionals' information search emphasizes information that supports a client's preferred position (positive cases) relative to information that supports the alternative position (negative cases), despite the fact that the positive cases are no more relevant to the client's fact pattern than are the negative cases. They find that this confirmation bias results in inflated assessments of the likelihood of judicial success for the client's preferred position and stronger recommendations for the client-preferred tax position, even when the position is not legally supportable. In other words, client preference has an indirect, positive effect on recommendations. In addition, Cloyd and Spilker (1999) find evidence of a direct, positive effect of client preference on the strength of recommendations for the client-preferred position. That is, professionals tend to recommend the client-preferred position, over and above the effect that operates via information search.

Figure 1 provides a model consistent with Cloyd and Spilker's (1999) results. Links 1–3 represent the indirect effect of client preference on strength of recommendations. Link 4 represents the direct effect of client preference on strength of recommendations. Cloyd and Spilker (1999) find all four links to be positive and significant. We extend their model

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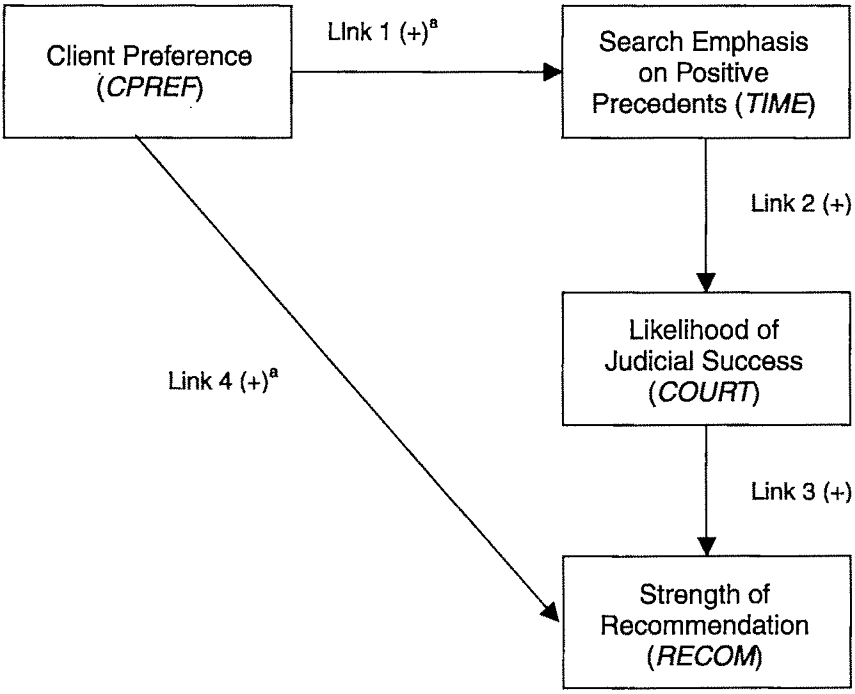
FIGURE 1
Hypothesized Model of the Effects of Practice Risk and Client Preference on Professionals' Recommendations


Client Preference (*CPREF*)
Link 1 (+)[a]
Search Emphasis on Positive Precedents (*TIME*)
Link 2 (+)
Likelihood of Judicial Success (*COURT*)
Link 4 (+)[a]
Link 3 (+)
Strength of Recommendation (*RECOM*)

This figure illustrates our process-based model of how client preference influences the strength of accounting professionals' recommendations. The parenthetical comment next to each link represents the expected coefficient sign.

[a] The strength of Link 1 and Link 4 is hypothesized to be moderated by the level of practice risk associated with the client.

by including practice risk. For reasons developed below, we expect that practice risk moderates the effects of client preference on recommendations. In particular, we expect that professionals advising clients with high levels of practice risk manage that risk by engaging in strategies that reduce both confirmation bias (Link 1) and the direct influence of client preference on their recommendations (Link 4).

Practice Risk and the Indirect Effect of Client Preference on Recommendations

A large body of evidence shows that when gathering new evidence, decision makers' search processes are biased toward obtaining evidence that supports their prior beliefs (e.g., Snyder and Swann 1978) or their preferred conclusions (e.g., Lundgren and Prislin 1998). Following Jonas et al. (2001), we refer to this preference for evidence that confirms, rather than disconfirms, a preferred (i.e., pre-selected) alternative as "confirmation bias." The efficiency and effectiveness of confirmatory search depends on the relationship between the preferred alternative and truth (Klayman and Ha 1987; Church 1990). If one is compiling evidence in support of an appropriate alternative, then it is efficient; however, search for truth can be inefficient and ineffective when the preferred alternative is inappropriate because decision makers are likely to overlook important evidence that shows fault with that alternative. Nonetheless, confirmation bias is observed across a wide variety of decision contexts, including testing hypotheses about other people (e.g., Snyder and Swann 1978; Snyder 1981), hypothesis testing in rule-determination tasks (Wason and Johnson-Laird 1972; Klayman and Ha 1989), and causal inference tasks (Schustack and Sternberg 1981).

Confirmation bias can be particularly problematic in professional accounting contexts because professionals' desire to please their clients implies that their preferred position is likely the client-preferred position, which may be aggressive. Confirmation bias thus can magnify independence problems and lead professionals to support aggressive positions. Because accounting professionals can be held accountable by clients, shareholders, and regulators for making poor judgments, inadequate consideration of disconfirming evidence is particularly costly in this setting.

Cloyd and Spilker (1999) provide evidence that client preference biases accounting professionals' information search despite the high potential costs of poor judgment in this setting. Consistent with professionals overlooking important evidence against their preferred alternative, Cloyd and Spilker (1999) show that the extent to which search focuses on positive versus negative precedents is associated with higher assessments of the likelihood of judicial success for the client's preferred tax position and stronger recommendations for the client's preferred tax position. In their study, confirmatory search causes tax professionals to recommend legally inappropriate positions.

We are unaware of studies addressing whether client preference induces confirmatory information search among auditors; however, several studies suggest that auditors, like other decision makers, are prone to confirming initial hypotheses that come from sources other than the client. For example, an auditor's initial hypothesis about the likelihood of error influences which audit evidence is gathered in an analytical procedures task (Kaplan and Reckers 1989), and the frame (viability, bankruptcy) that an auditor is assigned in a going-concern case influences the nature of the evidence auditors say they will collect (Kida 1984). More recently, Turner (2001) found that knowing superiors' expectations resulted in biased information search by auditors. Given this evidence, and if, as Church (1990) asserts, the likelihood of engaging in confirmatory processes is higher when auditors are more committed to an alternative (e.g., because it is the client's preference and they want to maintain good relations with the client), then it is likely that auditors also engage in information search to confirm client preferences.

Despite the prevalence of confirmation bias across decision settings and its potentially hazardous consequences for decision makers, few studies have sought to identify situations in which confirmation bias is mitigated. Koehler (1991) argues that confirmation bias and the resulting belief perseverance are caused by a failure to fully consider alternatives beyond the preferred one. Once a plausible alternative has been identified and minimal efforts have been made to support it, little effort is applied to develop and investigate other alternatives. Koehler (1991) suggests that explicitly considering specific alternatives may mitigate confirmation bias by instigating additional information search in support of those alternatives, making search more balanced. We consider prior attempts to mitigate the extent of confirmation bias in relation to this theory.[3]

Researchers have examined whether group processes, decision-making experience, and training on the value of negative information items reduce focus on confirming information. Studies suggest group processes are ineffective. The preference for positive information over negative information persists in group decision settings as long as a substantial majority of members have the same preferred alternative when the task begins (Schulz-Hardt et al. 2000). In fact, groups composed of participants with homogeneous preferences choose a more biased information set than is predicted by the members' individual information choices, suggesting that group decision making may actually exacerbate confirmation bias (Schulz-Hardt et al. 2000). In a professional context, confirmation bias has been shown to survive the hierarchical review process (Barrick et al. 2004).

Similarly, there is no evidence that decision-making experience reduces confirmation bias. Groups of middle-level managers display the same level of confirmation bias as do lay people (Schulz-Hardt et al. 2000). Experience in a hypothesis-testing task (including feedback on the outcome of prior choices) does not reduce emphasis on positive information (Jones and Sugden 2001). However, academic training that focuses on the value of falsification appears to decrease confirmation bias. For example, students and faculty in math are more likely to use disconfirmatory strategies in an abstract rule-discovery task than are students and faculty in other areas (Jackson and Griggs 1988). Law students (who are taught the value of negative precedents) exhibit significantly lower levels of confirmatory search in examining legal precedents than do accounting students (Cloyd and Spilker 2000).

These results are consistent with Koehler's (1991) argument that explicitly considering alternatives can reduce confirmation bias. That is, although group settings provide opportunities for discussion and consideration of alternative points of view, groups consistently tend to discuss information shared among all members rather than information unique to some members (e.g., Stasser and Titus 1985), and groups' tendency to ignore negative information is well known (i.e., "groupthink" [Janis 1982]). Therefore, group settings are unlikely to encourage explicit consideration of alternatives and so do not reliably reduce confirmation bias. Similarly, although experience provides opportunities to learn, confirmatory processes are self-reinforcing. Positive information that is interpreted as supporting a hypothesis or alternative increases confidence in that hypothesis or alternative, even if it is not supportive, in a Bayesian sense (Jones and Sugden 2001). Thus, in the absence of clear, immediate feedback about decision quality, decision makers are unlikely to learn of poor judgment quality in a timely manner and so experience does not reliably reduce confirmation bias. On the other hand, academic training that encourages explicit consideration of negative evidence is more likely to be successful.[4]

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[3] Early studies of confirmatory search made use of the Wason task—an abstract task in which participants were presented with four cards, each with a letter showing, and were instructed to disconfirm a hypothesis such as "If there is a Q on one side of the card, then there is an even number on the other side" by selecting cards to turn over. Participants typically perform poorly in these tasks, and research has established that this is largely due to ambiguities in the instructions and lack of context (Griggs 1989). Therefore, making a task less ambiguous and abstract may reduce confirmatory search. The existence of confirmatory search in applied accounting tasks and other concrete, unambiguous tasks implies that confirmatory search is a more general problem.

We expect that high levels of practice risk will mitigate confirmation bias in information search by motivating professionals to engage in a more comprehensive and balanced information search. When practice risk is high, professionals who make biased judgments are more likely to experience monetary penalties, censure, loss of reputation, and malpractice litigation. These potential losses are salient to professionals (e.g., Kadous and Magro 2001). Accounting professionals can potentially protect themselves from these losses by engaging in a more complete and balanced consideration of alternatives when serving a high-practice-risk client.

In particular, drawing on research on accountability, when practice risk is high and potential losses are salient, we expect professionals to engage in "pre-emptive self-criticism" (Tetlock 1983; Tetlock et al. 1989). That is, we expect them to anticipate objections that important others (regulators, jurors, etc.) might have to their client's preferred alternative, consider multiple perspectives, and think in more complex ways. Consistent with Koehler's (1991) argument that considering alternatives other than the preferred one will decrease confirmation bias, we expect that these professionals will seek information about shortcomings of the client-preferred position and will consider positive aspects of alternative positions. They will thus focus their search less on positive information about the client-preferred position than will professionals facing a low-risk client. This suggests our first hypothesis as follows:

> **H1:** Professionals advising high-practice-risk clients will focus their search on information that is consistent (versus inconsistent) with the client's preferred position to a lesser extent than will professionals advising low-practice-risk clients.

Returning to Figure 1, our first hypothesis implies the strength of Link 1 will depend on practice risk. Consistent with prior research, we expect that professionals who spend more time examining information supporting the client's preferred position will give higher estimates of the evidential support for that position (Link 2) and will more strongly recommend that the client take that position (Link 3) (Cloyd and Spilker 1999, 2000). Because practice risk is posited to affect the extent to which client preference influences search emphasis, we expect practice risk and client preference to interact to influence recommendations indirectly via their effects on information search and the likelihood assessments. This indirect effect is shown as Links 1–3 in Figure 1. Hypothesis 1 and our model imply that the indirect effect of client preference on recommendations will be less positive for high-risk clients than for low-risk clients because information search will be less biased for high-risk clients.

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[4] Davis and Solomon (1989) argue that the feedback necessary for learning from experience is absent from many professional accounting tasks. Domain-specific experience may reduce confirmation bias under a limited set of conditions, however. For tasks in which more experienced professionals have schema-driven search behavior, but experienced professionals do not possess an appropriate schema and default to a confirmatory search, experience could reduce confirmatory search (Kaplan and Reckers 1989). Also, if confirmatory search is due to the decision maker's inability to generate alternative hypotheses or to recognize disconfirming evidence, then experience may reduce confirmation bias (Church 1990). We expect domain-specific experience to have little impact on the extent of confirmatory search when professionals perform research to determine the appropriateness of a reporting position. Such tasks are unstructured and include numerous relevant dimensions, making it unlikely that experienced professionals would develop search schemas. Further, alternatives (position is appropriate, position is not appropriate) are readily available and disconfirming evidence is easy to recognize.

The Direct Effect of Practice Risk and Client Preference on Recommendations

As described above, we expect practice risk to moderate both indirect and direct effects of client preference on accounting professionals' recommendations. We have previously noted that prior research in auditing and tax finds that accounting professionals tend to support their clients' preference, even when that preference is aggressive, as long as practice risk is relatively low. This effect is independent of any confirmatory bias in information search. For example, auditors allow aggressive reporting methods preferred by their clients (e.g., Hackenbrack and Nelson 1996; Haynes et al. 1998; Kadous et al. 2003), and tax professionals similarly make recommendations that support the client's preferred position (Schisler 1994; Cuccia et al. 1995; Cloyd and Spilker 1999).

However, research also demonstrates that professionals' willingness to support the client may not extend to higher risk situations. Hackenbrack and Nelson (1996) show that auditors are less likely to allow a client to use an aggressive reporting method when that client has a higher likelihood of imposition of debt covenants by lenders, is planning an IPO, and is a new (versus continuing) client. Blay (2005) finds that when litigation risk is high, auditors are more likely to issue a modified audit report. Kadous and Magro (2001) show that tax professionals less strongly recommend challenging an Internal Revenue Service (IRS) position for a client with high practice risk than for a client with low practice risk.

Research manipulating imposition of penalties by the taxing agency, rather than a more comprehensive view of practice risk, is less conclusive. Reckers et al. (1991) find that as the threat of penalty decreases, professionals' willingness to sign a return with an aggressive position increases, but the aggressiveness of their recommendations is unchanged. CPAs in Cuccia's (1994) study are no less aggressive with the threat of monetary penalties, and, in fact, they exert more effort to find tax-reducing items when penalties are possible (though this result does not hold for non-CPA practitioners). Newberry et al. (1993) show that professionals make more aggressive recommendations when they are told that the intent to enforce penalties is high. Finally, Cloyd and Spilker (1999) find no difference in information search behavior or recommendations when the probability of IRS audit is low versus high.

We believe these mixed results arise from the fact that penalties imposed by the taxing agency are a minor component of practice risk. In an experimental context in which penalties were manipulated, Collins et al. (1990) report that tax professionals rate penalties as least significant of the potential consequences for making inappropriate judgments. Damage to client relationships, damage to reputation with other professionals, and loss of right to practice before the IRS all ranked higher. These costs are more likely to arise when dealing with a high-practice-risk client (e.g., a litigious client or one that is unable to provide documentation). Accordingly, we expect that professionals will be less likely to support aggressive client-preferred positions for high-practice-risk clients, beyond any effect captured by information search. In other words, we expect to observe a direct effect of client preference on client recommendations (Link 4), and we expect that effect to be moderated by practice risk as follows:

H2: The direct effect of client preference on professionals' recommendations is less positive for professionals advising high-practice-risk clients than it is for professionals advising low-practice-risk clients.

The Overall Effect of Practice Risk and Client Preference on Recommendations

We can now use our model to develop expectations for the overall influence of practice risk and client preference on recommendations (i.e., the combined indirect and direct effects). When practice risk is low, the client's preference will result in an information search emphasis on positive precedents (Figure 1, Link 1), which will inflate the perceived likelihood of judicial success (Link 2), ultimately inflating the strength of the recommendation for the client's preferred position (Link 3). At the same time, the client's preference will directly increase the strength of the recommendation for the client's preferred position (Link 4). Overall, client preference will have a large, positive impact on recommendations to clients, as in prior research (Cloyd and Spilker 1999). On the other hand, when practice risk is high, our H1 and H2 predict that Links 1 and 4 will be significantly less positive. The indirect effect of high-risk clients' preferences on recommendations will be smaller because professionals will experience less confirmation bias for those clients. At the same time, the direct effect of high-risk clients' preferences on recommendations will be smaller because professionals will be less willing to take a risky position for those clients. This suggests an interaction of practice risk and client preference for recommendations as follows:

H3: Professionals advising high-practice-risk clients will provide recommendations that are less consistent with the client's preference than will professionals advising low-practice-risk clients.

III. RESEARCH METHOD

We test our hypotheses using a web-based experiment in which tax professionals were asked to determine the appropriate tax treatment for a series of real estate transactions. Professionals searched relevant court case summaries to determine whether the client should be treated as an investor or a dealer for tax purposes. Client preference and practice risk were each manipulated between participants at two levels within the experimental materials. The software randomly assigned participants to one of the four experimental conditions.

Participants

In order to obtain a broad cross-section of professionals as participants, we used two recruitment methods. First, an author asked contacts at four international and one national public accounting firm to forward a recruitment letter to professionals with at least two years of tax experience. Interested professionals were asked to email the author to get information needed to access the experimental materials on the password-protected website. While we cannot know how many individuals received the recruitment letter, 58 professionals indicated willingness to participate by requesting access. Of those, 45 (78 percent) completed the task. Simultaneously, we obtained a list of 100 tax practitioners' email addresses from a state society of CPAs. Of the 82 addresses that were usable, 18 (22 percent) professionals completed the study.

In total, 63 tax professionals participated in the study. Their tax experience ranged from 26 to 240 months, with a mean (standard deviation) of 79.19 (39.30) months. Most were at the rank of senior staff (33 percent) and manager (37 percent), with the remainder being senior managers (25 percent) and partners (5 percent). Participants were primarily employed by international accounting firms (65 percent), with others employed by national (16 percent), regional (16 percent), and local accounting firms (3 percent). Eighty-six percent held advanced degrees in accounting or tax; 11 percent held law degrees.

Procedures

The experiment began with a training module to familiarize participants with the form and structure of the database. After working through the training module, participants had access to the experimental materials, including an assignment memo, client facts, a discussion of factors affecting the investor/dealer determination, and a database of tax cases.[5] The assignment memo and client facts described the firm's relationship with the client, characteristics of the real estate transactions (including whether they resulted in a gain or loss), and the participant's assignment: (1) to conduct tax research using the provided database to determine whether the client should be treated as an investor or a dealer with respect to the real estate transactions and (2) to identify cases that the participant would cite in a memo communicating her conclusions to her manager.

The client facts described the circumstances surrounding the real estate transactions and identified whether the transactions resulted in a gain or loss for the client. The facts were intentionally ambiguous with respect to the issue of investor/dealer status. Participants were allowed to search the database for up to 30 minutes. We imposed a time limit to mirror time constraints of a practice situation in which professionals typically cannot read all available authorities. Participants were informed of the time limit and the remaining time showed on their screens while they searched.

From a main menu, participants could access the assignment memo, summary of factors, client facts, case database, and notebook, or they could choose to end their search at any time. Cases were organized by factor with six cases available for each factor. Half of the cases for each factor supported investor treatment, and half supported dealer treatment. Within each case, participants could link to the case issue, case conclusion, case facts, or case analysis. Further, from within any case, participants could return to the client facts, save the case to a notebook, or return to the main menu. Cases were abstracted from actual court cases; all were relevant to the determination of investor/dealer status, and none was determinative. Each case was labeled with the court's conclusion (e.g., "Taxpayer's gain was ordinary income").

Upon completing their research, participants reported the strength with which they would recommend investor versus dealer treatment and the likelihood of success in court if the issue were litigated. Participants then responded to demographic measures and manipulation checks.

Manipulated Variables

Client Preference

To manipulate client preference, we relied on the fact that capital gains and losses receive different tax treatment than do ordinary gains and losses. Whether the gains and losses are characterized as ordinary or capital depends on the character of the underlying asset, the land. If the land is deemed to be the stock in trade (inventory) of the seller, then the seller is a dealer, the asset is ordinary, and the gain/loss is characterized as ordinary. If the underlying asset is deemed not to be the stock in trade of the seller, then the seller is an investor, the asset is a capital asset, and the resulting gain/loss is characterized as capital. In the experimental scenario, capital gains would be taxed at no more than 20 percent, while ordinary gains would be taxed at 38.6 percent. Capital losses would be limited to $3,000 this year, while ordinary losses could be deducted without limit. Accordingly, the client prefers capital (i.e., investor) treatment if the sales result in gains and ordinary (i.e., dealer) treatment if the sales result in losses.

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[5] Experimental materials are based on Cloyd and Spilker's (1999) instrument. We had the materials programmed for web-based data collection, and we adapted them to incorporate the practice risk manipulation.

We manipulated the basis of the land while holding selling price constant such that the client had sold the lots at a loss in the dealer-preference condition and a gain in the investor-preference condition. Further, the assignment memo in the dealer-preference (investor-preference) condition explicitly stated that the client preferred to be treated as a dealer (investor) in order to deduct the full loss against ordinary income (receive the benefit of the lower capital gains tax rate).

Practice Risk

We manipulated practice risk via client characteristics drawn from the tax practice literature, following Kadous and Magro (2001). The low-practice-risk client has successfully defended positions during prior audits, responds promptly to requests for information or documentation, and has no history of engaging his tax practitioner or others in litigation. The high-practice-risk client has been unable to successfully defend positions during prior audits, responds slowly or fails to respond to requests for information or documentation, and has a history of engaging his prior tax practitioner and others in litigation. The client in the Cloyd and Spilker (1999) study is similar to the low-risk client in our study because their instrument made no mention of the client characteristics we use to create high practice risk.

Dependent Variables

The dependent variable for our first hypothesis is a standardized measure of professionals' relative emphasis on positive versus negative cases in information search (*TIME*). This variable is measured as the amount of time spent viewing investor cases minus the time spent viewing dealer cases, divided by the total time spent viewing all cases. A positive value reflects a focus on investor cases and a negative value reflects a focus on dealer cases. Balanced viewing of investor and dealer cases would result in a measure of zero. The dependent variable for our second and third hypotheses is the strength with which participants recommended the client take a particular position on the client's tax return (*RECOM*). It ranges from −3 ("strongly recommend dealer") to +3 ("strongly recommend investor").

We conduct path analysis to test our first two hypotheses and to identify how practice risk modifies the results of prior research. Accordingly, while we have no formal hypotheses regarding participants' assessed likelihood of judicial success of the client-preferred position (*COURT*), we include this variable in our path analysis. *COURT* is measured on a scale ranging from 0 to 100 percent, with a response of 100 (0) indicating a likelihood of 100 percent that the court would rule that the client was an investor (a dealer) should the case go to court.

IV. EMPIRICAL RESULTS

Manipulation Checks

To verify that participants understood the client's preference, we asked participants whether the client preferred to be treated as an investor or a dealer. All participants identified the correct client preference for their experimental condition. To test whether our manipulation of practice risk was effective, we asked participants to rate how risky the client was relative to the population of all possible clients on a scale ranging from lowest (1) to highest (7) possible risk. Mean (standard deviations of) risk ratings were 5.87 (1.18) and 2.47 (1.14) for the high- and low-practice-risk conditions, respectively. A t-test confirms that the means are different ($t_{61} = 11.68$, $p < 0.01$), indicating a successful manipulation of practice risk.[6]

Descriptive Statistics

Table 1 provides summary statistics regarding professionals' information search behavior. The table shows the average number of case components viewed, number of cases viewed, number of cases saved, and time spent viewing cases by client preference and by the position the case supports. In the low-practice-risk conditions (Panel A), which are comparable to Cloyd and Spilker's (1999) setting, professionals' search behavior was apparently focused on cases supporting the client preference. These results are consistent with those of Cloyd and Spilker (1999). However, in the high-practice-risk conditions (Panel B), professionals' search appears more balanced. Table 2 provides descriptive statistics for the measured variables in our model (Panel A) and a table of correlations among them (Panel B). We formally test our hypotheses below.

Tests of Hypotheses

We use structural equations-based path analysis to test our first two hypotheses. The main advantage of using path analysis is that it allows for simultaneous testing of all relationships in the model, so we can isolate the direct and indirect effects of client preference on professionals' recommendations. An additional advantage is that it allows us to compare results with prior research. We use ANOVA to test our third hypothesis, which concerns the overall effect of client preference and practice risk on judgments.

To test H1, we first estimate a model that allows Link 1 to vary with practice risk and constrains Links 2–4 to be equal for the low- and high-practice-risk conditions. The Tucker-Lewis Index, a measure of the proportion of improvement of the fit of the model over a null model, is 94.9 percent. This is above the accepted cutoff value of 90 percent (Kline 1998, 131), indicating an acceptable fit.[7] This model, along with unstandardized path coefficients for the low- and high-practice-risk conditions, is presented in Figure 2. Unstandardized coefficients show the effect of a unit change in the independent variable on the dependent variable. We use t-tests to test the significance of each path coefficient.[8]

We next assess whether the relationship between client preference and search emphasis (Link 1) depends on practice risk. Consistent with H1, client preference positively influences the relative amount of search time spent on positive versus negative precedents for low-practice-risk clients ($t_{51} = 10.71$, $p < 0.01$), but client preference does not influence search emphasis for high-practice-risk clients ($t_{51} = 0.64$, $p = 0.53$). The effect of client

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[6] In an ANOVA model for risk, client preference is insignificant ($p = 0.85$) and the interaction of client preference and practice risk is significant ($p = 0.05$). Follow-up tests indicate that the simple main effect of practice risk is significant for both levels of client preference, suggesting that the manipulation is effective despite the interaction.

[7] Several fit indices are typically reported because no single index has emerged as superior to the others. For our model, the Chi-squared test, a test of the extent to which the model perfectly fits the data (i.e., that estimation errors are zero) indicates a marginal fit ($\chi^2_7 = 14.20$, $p = 0.05$). However, this test is overly restrictive and other fit indices have been developed to address its limitations (Byrne 2001, 81). The Incremental Fit Index, which takes model parsimony and sample size into account, is 97.1 percent, which is above the cutoff of 95 percent for a well-fitting model (Byrne 2001, 83).

[8] Standardized path coefficients can differ across groups solely because the variances of the associated variables differ across conditions. Accordingly, experts recommend that comparisons of a variable's influence across groups be made with unstandardized coefficients (Bollen 1989, 126).

TABLE 1
Information Viewed by Experimental Condition

Panel A: Information Viewed by Client Preference in the Low-Practice-Risk Condition

	Client Preference Condition			
	Dealer-Preferred (n = 15)		Investor-Preferred (n = 17)	
	Investor Cases	Dealer Cases	Investor Cases	Dealer Cases
Average Number of Case Components Viewed per Participant				
Case Issues	0.73	3.13	3.24	1.94
Case Facts	4.07	9.53	9.65	5.82
Conclusions	1.47	2.27	2.18	1.41
Analysis	2.60	7.47	9.24	4.47
Total	8.87	22.40	24.29	13.65
Average Number of Cases Viewed Per Subject	4.47	10.80	11.65	8.12
Average Time Spent Viewing Cases in Minutes	4.07	14.34	13.41	5.64
Average Number of Cases Saved as Relevant	0.67	3.93	5.41	2.18

Panel B: Information Viewed by Client Preference in the High-Practice-Risk Condition

	Client Preference Condition			
	Dealer-Preferred (n = 16)		Investor-Preferred (n = 15)	
	Investor Cases	Dealer Cases	Investor Cases	Dealer Cases
Average Number of Case Components Viewed per Participant				
Case Issues	3.94	4.38	2.27	2.00
Case Facts	7.50	8.25	7.20	7.87
Conclusions	3.88	4.06	2.13	1.60
Analysis	6.56	6.94	7.27	8.07
Total	21.88	23.63	18.87	19.53
Average Number of Cases Viewed Per Subject	9.31	9.88	10.13	10.73
Average Time Spent Viewing Cases in Minutes	9.01	9.25	10.32	10.03
Average Number of Cases Saved as Relevant	3.75	2.62	2.93	3.47

This table shows means for several measures of the information consistent with dealer or investor status viewed by client preference (i.e., dealer or investor) separately for the low-practice-risk (Panel A) and high-practice-risk (Panel B) conditions.

Client preference was manipulated by varying the results of the client's transaction. When the transaction results in a gain, the investor position is more favorable. When the sale results in a loss, the dealer position is more favorable.

Practice risk was manipulated through client characteristics. The low-practice-risk client has been able to successfully defend positions during prior audits, responds promptly to requests for information or documentation, and has not instigated litigation against his prior tax practitioner or others. The high-practice-risk client has been unable to successfully defend positions during prior audits, responds slowly if at all to requests for information or documentation, and has a history of suing his tax practitioner and others in litigation.

The figure for total components is not always equal to the sum of amounts for individual components due to rounding.

TABLE 2
Descriptive Statistics for Dependent Variables

Panel A: Means (Standard Deviations) of Dependent Variables by Experimental Condition

	Client Preference Condition			
	Dealer		Investor	
	Low Practice Risk (n = 15)	High Practice Risk (n = 16)	Low Practice Risk (n = 17)	High Practice Risk (n = 15)
TIME	−0.58 (0.29)	−0.04 (0.24)	0.42 (0.24)	0.01 (0.23)
COURT	28.33 (11.75)	50.94 (9.70)	68.82 (12.44)	52.60 (13.34)
RECOM	−1.60 (1.35)	0.44 (1.41)	1.65 (1.06)	−0.33 (1.45)

Panel B: Pearson Correlations (p-values)

	TIME	*COURT*	*RECOM*
TIME	1.00		
COURT	0.91 (< 0.01)	1.00	
RECOM	0.78 (< 0.01)	0.88 (< 0.01)	1.00

This table shows descriptive statistics for the measured variables by experimental condition (Panel A) and the correlations among those measures (Panel B).

The manipulations are described in the notes to Table 1.

TIME = difference in time spent viewing investor versus dealer cases, divided by the total time spent viewing cases; a negative number represents a relative emphasis on cases with dealer outcomes;

COURT = subjective probability of judicial success of the investor position elicited on a scale from 0 (labeled "0 percent probability of investor" [i.e., 100 percent probability of dealer]) to 100 [labeled "100 percent probability of investor" (i.e., 0 percent probability of dealer]); and

RECOM = ranges from −3 ("Strongly recommend dealer") to +3 ("Strongly recommend investor").

preference on search emphasis is significantly larger for low-risk clients ($\chi_1^2 = 39.68$, $p < 0.01$), supporting H1.[9,10]

To test H2, we release the constraint that Link 4 be equal across the two levels of practice risk and test whether this improves the fit of the model. This analysis reveals that the direct effect of client preference on strength of recommendation does not vary across

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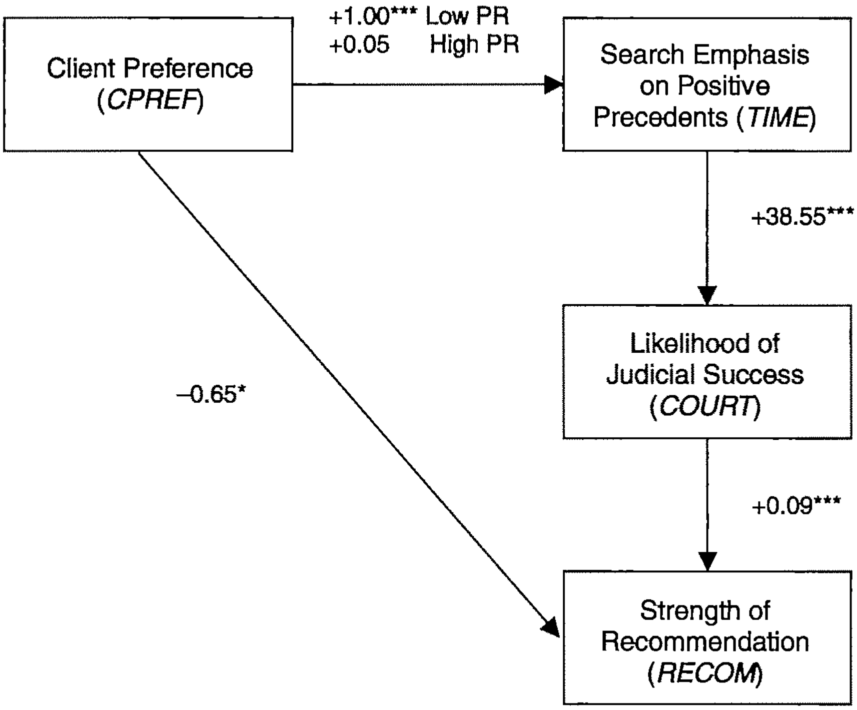
[9] We use a nested model comparison to test for the hypothesized interaction (Rigdon et al. 1998). Two models are compared—one that permits the path from client preference to search emphasis to vary across the low- and high-practice-risk conditions, and one that restricts it to be equal in the two conditions. A significant interaction reflects that the unrestricted model provides a significantly better fit for the data than the restricted model.

[10] An ANOVA model for search emphasis yields identical inferences, as do ANOVA models for other measures of search emphasis. That is, we construct additional dependent measures reflecting the relative emphasis on investor versus dealer cases for the number of case components viewed, the number of cases viewed, and the number of cases saved (see Table 1). Separate ANOVA models for each of these measures shows a significant interaction of client preference and practice risk of the form predicted by H1 ($p < 0.01$), a significant main effect of client preference (driven by the low-risk condition) ($p < 0.01$), and an insignificant effect of practice risk (smallest $p = 0.10$).

FIGURE 2
Empirical Path Model of the Effects of Practice Risk and Client Preference on Professionals' Recommendations


Client Preference
(*CPREF*)
+1.00*** Low PR
+0.05 High PR
Search Emphasis on Positive Precedents (*TIME*)
+38.55***
Likelihood of Judicial Success (*COURT*)
+0.09***
−0.65*
Strength of Recommendation (*RECOM*)

*, **, *** $p < 0.05$, $p < 0.01$, and $p < 0.001$, respectively.
This figure shows the results of the path analysis designed to simultaneously test the relationships among our variables. The unstandardized path coefficient is shown next to each link, along with a key indicating the level of significance of the path. Overall goodness of fit is tested with the Tucker-Lewis index (94.9 percent), which measures the proportion of improvement of the fit of the model over a null model.
The direct effect of *CPREF* on *RECOM* is −0.65 for both low- and high-practice-risk clients.
The indirect effect of *CPREF* on *RECOM* for low-practice-risk clients is +3.47; the total effect is +2.82.
The indirect effect of *CPREF* on *RECOM* for high-practice-risk clients is +0.17; the total effect is −0.48.

practice risk ($\chi_1^2 = 1.52$, $p = 0.22$).[11] Thus, H2 is not supported and the model presented in Figure 2 best represents the data.

Recall that the path from client preference to search emphasis depends on practice risk. Consistent with expectations, the extent of confirmation bias is significantly smaller for high-risk clients than for low-risk clients. Note that the paths from search emphasis to likelihood of judicial success (Link 2) and from likelihood of judicial success to strength of recommendation (Link 3) are significant and positive ($t_{51} = 17.20$, $p < 0.01$ and $t_{51} = 15.41$, $p < 0.01$, respectively). These paths are consistent with theory and with Cloyd and Spilker's (1999) results. The direct path from client preference to strength of recommendation (Link 4) is significant and negative ($t_{51} = -2.62$, $p = 0.01$) and does not vary by client risk level, indicating that professionals adjust their recommendations *away* from client preference, irrespective of practice risk. This negative direct effect is inconsistent with Cloyd and Spilker's (1999) results and likely implies a conservative reaction to increased levels of environmental practice risk since that study was conducted.[12]

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[11] This interaction is tested using a nested model comparison as described in footnote 9.

The total effect of client preference on recommendations can be calculated by multiplying unstandardized coefficients along the indirect path and adding the coefficient for the direct path in Figure 2. For low-practice-risk clients, client preference has an indirect effect of +3.47 (i.e., 1.00 × 38.55 × 0.09) on recommendations and a direct effect of −0.65. The net overall effect is a large positive influence of client preference on recommendations (i.e., +3.47 − 0.65 = +2.82), as in prior research. However, for high-practice-risk clients, the indirect effect of client preference on recommendations is only +0.17 (i.e., 0.05 × 38.55 × 0.09), and this indirect effect is overshadowed by the direct effect of −0.65 (i.e., net effect: +0.17 − 0.65 = −0.48).

To verify that the hypothesized pattern is statistically significant, we estimate an ANOVA model for recommendations. Mean recommendations by experimental condition are provided in Table 2, Panel A. The ANOVA results are presented in Table 3, Panel A. Consistent with H3, the interaction of client preference and practice risk is significant ($F_{1,59} = 36.40$, $p < 0.01$). Follow-up analyses (Table 3, Panel B) reveal that the influence of client preference on recommendations is positive and significant when practice risk is low ($F_{1,59} = 48.24$, $p < 0.01$), but negative and insignificant when practice risk is high ($F_{1,59} = 2.64$, $p = 0.11$). In other words, we find that recommendations are biased in favor of the client-preferred position when practice risk is low, but not when it is high.

Model Robustness Checks

We conduct sensitivity analysis by reviewing modification indices for the model. These indices estimate the increase in the model fit that could be obtained by adding or deleting specific paths, thereby allowing examination of whether the components are connected in

TABLE 3

The Overall Effect of Client Preference and Practice Risk on Professionals' Recommendations

Panel A: Analysis of Variance

Source	df	SS	F	p
Client Preference	1	24.08	13.83	<0.01
Practice Risk	1	0.01	0.01	0.93
Client Preference * Practice Risk	1	63.39	36.40	<0.01
Error	59	102.75		

Panel B: Simple Effects

Source	F	p
Simple effect of Client Preference when Practice Risk is low	48.24	<0.01
Simple effect of Client Preference when Practice Risk is high	2.64	0.11

This table shows the analysis of variance results for professionals' recommendations to clients (*RECOM*) (Panel A) and the simple effects of client preference for the two levels of practice risk.
Independent variables are described in the notes to Table 1.
Dependent measures are described in the notes to Table 2.

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[12] Alternatively, it could imply a decrease in professionals' willingness to being viewed as pro-client.

a way not specified by our theoretical model. An examination of modification indices suggests that allowing the error terms of likelihood of judicial success and strength of recommendations to be correlated significantly improves the fit of the model. When we add this path, the model fit is excellent.[13] In this revised model, the interaction of client preference and practice risk for search emphasis is still highly significant ($\chi^2_1 = 39.68$, $p < 0.01$), and the interaction of client preference and practice risk for strength of recommendations is not ($\chi^2_1 = 0.59$, $p = 0.44$). All inferences about paths are identical to the reported results and none of the coefficients is appreciably changed. Modification indices to this revised model suggest that no additional paths will further improve the model's fit.

Additional Analyses

To provide further evidence about the process by which practice risk influences information search behavior, we asked participants to assess how important each of four goals was to them while they were completing the study. The goals were to (1) build a justifiable case supporting the client's preferred position; (2) find support for the client's preferred position; (3) find reasons that the client's preferred position might not be allowed; and (4) identify the position that would be most appropriate in the eyes of the IRS. We assessed commitment to these four goals using a scale refined and validated by Klein et al. (2001). The scale requires participants to indicate their level of agreement with five items for each goal on five-point Likert scales. The five items are shown in Exhibit 1. To develop a unitary measure of commitment for each of the goals, we perform factor analysis on responses to the five items for each goal. In each case, the eigenvalue for the first factor exceeds 3.3 and all other eigenvalues are less than 0.7, indicating that the data are appropriately summarized in one factor for each goal. We thus use the factor score for each goal as a dependent measure in our analyses.

Based on prior evidence of client preference effects, we expect professionals with low-risk clients will be motivated to build a case to support their preferred position. Our theory implies that accounting professionals will be more committed to building a case for the client's preferred position (Goal 1) and finding support for the client's preferred position

EXHIBIT 1
Goal Commitment Measures

1. I thought this was a good goal to shoot for.
2. I was strongly committed to pursuing this goal.
3. It was hard to take this goal seriously. (R)
4. Quite frankly, I didn't care if I achieved this goal or not. (R)
5. It wouldn't have taken much to make me abandon this goal. (R)

We used these five items to measure commitment. The items comprise a scale developed by Klein et al. (2001), and were applied to four goals: (1) build a justifiable case supporting the client's preferred position; (2) find support for the client's preferred position; (3) find reasons that the client's preferred position might not be allowed; and (4) identify the position that would be most appropriate in the eyes of the IRS. Items followed by "R" are reverse-scored.

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[13] The Tucker-Lewis Index is 101.2 percent; Chi-squared is no longer significant ($\chi^2_5 = 3.75$, $p = 0.58$), and the Incremental Fit Index is 100.5 percent. This path has no theoretical significance, but indicates correlated errors for likelihood of judicial success and strength of recommendations. We believe the correlation arises from common method variance in that both are scale variables.

(Goal 2) for low-risk clients than for high-risk clients. Our theory also predicts that high-risk clients will make potential losses salient to professionals and will motivate them to consider other perspectives and alternatives to the client's preference in order to reduce exposure to risk. This reasoning also implies that professionals will be more committed to knowing the evidence against the client's position (Goal 3) and identifying the position that the IRS will find most appropriate (Goal 4) for high-risk clients.

Results of 2 × 2 ANOVA models for each of the four goal commitment measures support our theory. All four models reveal a significant main effect of practice risk (all $p < 0.01$) and no other significant effects (smallest $p = 0.18$). For Goals 1 and 2, goal commitment is higher for the low-risk client than for the high-risk client. For Goals 3 and 4, the opposite result obtains. In our study, professionals are more motivated to build a case for and find support for a client's preferred position when the client is low risk, and they are more motivated to find evidence against a client's preferred position and to identify the position that the IRS will view as most appropriate when the client is high risk.

Alternative Explanations

In this section, we consider whether our results may have been driven by differences in client desirability, rather than practice risk, or by a randomization failure. The first potential alternative explanation is that professionals view the high-risk client as less desirable and, as a result, are less willing to exert themselves on behalf of that client. Practice risk is a component of client desirability in that, all else equal, more risky clients are less desirable than are less risky clients. However, our data are inconsistent with the desirability explanation.

First, extent of search measures reveal that professionals in our study did not exert less effort when the client was of high risk (and therefore less desirable). We construct extent of search variables from the search measures in Table 1 by adding the measures related to investor and dealer cases within each condition. For example, total number of case components viewed is the number of investor case components viewed plus the number of dealer case components viewed. We construct four measures: total number of case components viewed, total number of cases viewed, total time spent searching, and total number of cases saved. We find no effect of practice risk on effort for time or for cases saved (both $p > 0.50$). However, we find *higher* effort for the high-risk client when using number of case components viewed ($p = 0.03$) and number of cases saved ($p = 0.01$) as measures of effort. Thus, professionals worked just as hard or harder when conducting searches for the high-risk client. This result is consistent with our theory and with Magro's (2005) finding that tax professionals conduct more extensive search in a high-risk (planning) versus low-risk (compliance) setting.

Second, the goal commitment data are inconsistent with the professional being less willing to exert effort on behalf of the less desirable (high-practice-risk) client. As is reported above, professionals reporting being *more* committed to goals of finding reasons against the client taking its preferred position and determining the most appropriate position for a high-risk client than for a low-risk client. These actions are means of managing the risk presented by high-risk clients, and higher commitment to these goals is consistent with theory and with a manipulation of practice risk. While a professional may be willing to invest effort to find reasons against the position of an undesirable client, we believe it unlikely that a professional would be more committed to identifying the best position for an undesirable client. Thus, the goal data also support the theoretical explanation over the client-desirability explanation.

To ensure that a randomization failure does not drive our results, we test whether experimental condition is associated with demographic variables. We find that condition is not associated with firm type (international versus other) (χ^2_3 = 1.82, p = 0.61), previous experience with the broker/dealer issue (χ^2_3 = 1.12, p = 0.77), or months of general accounting experience ($F_{3,59}$ = 2.08, p = .11), indicating successful randomization of these demographic features across experimental conditions. Further, when we add these employer and experience variables to ANOVA models for each of our dependent variables (either singly or all at once), none is significant and reported inferences are unchanged. Therefore, hypothesized results are not driven by differences in employer or experience across conditions.

V. DISCUSSION AND CONCLUSION

This study demonstrates that high practice risk mitigates confirmation bias in accounting professionals' information search. Confirmation bias can be costly because it can cause professionals to neglect important information that indicates that the preferred alternative is inappropriate. Professionals who are unaware of important negative evidence cannot take that information into account, and so biased search often results in biased judgment. Prior research demonstrates that accounting professionals engage in confirmatory information search and that they make overly aggressive recommendations to clients as a result (Cloyd and Spilker 1999).

Consistent with prior research (Cloyd and Spilker 1999), we find that accounting professionals with low-practice-risk clients focus on information that is consistent with client preference at the expense of viewing information contrary to client preference. This biased search process causes professionals to believe the client's preferred position has more evidential support than is warranted, and it ultimately influences recommendations to clients.[14] In contrast, professionals advising high-practice-risk clients perform a more balanced search and make more objective and less aggressive recommendations. Thus, high practice risk serves as a boundary condition on confirmation bias. Accounting professionals apparently recognize high practice risk and adapt their decision strategies to cope with it.

This study demonstrates how accounting professionals balance a desire to serve and retain clients against a desire to avoid costs associated with inappropriate judgments. Prior research has established that pressure to serve and retain clients leads to both direct and indirect effects of client preference on judgments. We posit and find that as the potential cost of inappropriate judgments increases, the indirect effect of client preference is reduced. Confirmation bias has proven pervasive and difficult to eliminate. However, this study identifies a characteristic of the decision environment that allows decision makers to avoid the bias when its potential for harm is greatest.

Finally, because regulators have increased their scrutiny of and penalties for aggressive judgments made by tax and other accounting professionals recently, professionals view environmental practice risk as having increased (e.g., Lipton 2003; Muler and Katz 2003). As a result, professionals might reasonably make more conservative client recommendations for all client types. Thus, we examine whether the direct and indirect effects of client preference on recommendations observed by Cloyd and Spilker (1999) persist in the current environment. Results from our low-risk condition replicate those of Cloyd and Spilker

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[14] That tax professionals believed the client-preferred position had more support than it did is implied by the fact that assessed likelihood of judicial success is dependent on client preference in our low-practice-risk conditions ($F_{1,59}$ = 92.75, p < 0.01), but not in our high-practice-risk conditions ($F_{1,59}$ = 0.15, p = 0.70). The interaction of practice risk and preference is significant ($F_{1,59}$ = 42.03, p < 0.01).

(1999) in that accounting professionals' information search processes and recommendations continue to be biased in favor of the low-risk client. However, in contrast to prior research that suggests a positive, direct relation between client preference and recommendations, we find a significant negative relation between client preference and recommendations for both low- and high-practice-risk clients. That is, all else equal, professionals tend to recommend positions that are contrary to the client's preferences. We expect that this conservatism is a response to the new regulatory environment that discourages aggressive recommendations. Future research could investigate this issue more directly.

These results demonstrate the complexities of client preference effects and highlight the importance of studying decision processes. One interpretation of the results is that while professionals may be able to make conservative adjustments to recommendations in light of increased environmental risk, they have less control over their decision processes, which are an important determinant of those recommendations. In particular, the extent to which information search is confirmatory appears to be determined by the extent to which the balance of incentives encourages the professional to consider other alternatives. Future research could examine whether additional means of stimulating broader search, such as explicitly asking professionals to consider alternatives, could reduce confirmation bias and improve judgment quality.

Information search has long been an important component of tax professionals' duties, as they must search large databases of precedents to resolve client issues. The recent issuance of FIN No. 48, which requires on-going evaluation of all relevant facts and tax authorities to determine the likelihood of sustaining uncertain tax positions, highlights the importance of the quality of this search to the quality of financial reports. Top managers certifying the accuracy of the financial statements and auditors issuing opinions about the same will want to ensure that tax professionals make unbiased judgments about supportability.

A potential limitation of our study is that because perceptions of risk and affect are inextricably linked (e.g., Johnson and Tversky 1983; Slovic and Peters 2006), it is possible that in manipulating practice risk we also manipulated affect toward the client. Research in accounting shows that emotional reactions to interpersonal interactions can be important inputs into decision behavior (Kida et al. 2001; Moreno et al 2002). Future research could investigate the impact of affect toward the client on professionals' information search behavior.

A second potential limitation is that accounting professionals do not make decisions alone, and so it is possible that group processes embedded in the professional environment might eliminate or counteract individual-level confirmation bias even for low-risk clients. However, we are aware of no research suggesting that group processes eliminate confirmation bias, and prior research has demonstrated that hierarchical review is ineffective in this regard (Barrick et al. 2004). Future research could test the efficacy of other group processes.

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SEC Scrutiny and the Evolution of Non-GAAP Reporting

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ABSTRACT: We empirically examine the effects of intensified scrutiny over non-GAAP reporting on the quality of non-GAAP earnings exclusions. We find that, on average, exclusions are of higher quality (i.e., more transitory) following intervention by the Securities and Exchange Commission (SEC) into non-GAAP reporting. We further find that firms that stopped releasing non-GAAP earnings numbers after the SEC intervention had lower quality exclusions in the pre-intervention period. These results are consistent with the SEC's objectives of improving the quality of non-GAAP earnings figures. However, when we decompose total exclusions into special items and other exclusions, we find evidence that the quality of special items has decreased in the post-intervention period, which suggests that managers adapted to the new disclosure environment by shifting more recurring expenses into special items. This suggests that there may be unintended consequences arising from the heightened scrutiny over non-GAAP reporting.

Keywords: *non-GAAP (pro forma) earnings; street earnings; special items; Regulation G; Sarbanes-Oxley.*

Data Availability: *Data are available from the sources indicated.*

I. INTRODUCTION

Over the past decade, the frequency and magnitude of special items have increased dramatically, and earnings based on generally accepted accounting principles (GAAP) have become a noisier measure of true economic income (Collins et al. 1997; Givoly and Hayn 2000; Bradshaw and Sloan 2002). Not surprisingly, managers, analysts, and investors have adjusted their focus from GAAP earnings to alternative

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earnings-performance measures that attempt to measure "core" earnings (Bradshaw and Sloan 2002; Collins et al. 2005). These alternative measures are prominently displayed in press releases, forecasted by analysts, and used by investors in valuation, despite the fact that non-GAAP earnings numbers have no objective definition.

Prior research finds that these non-GAAP earnings numbers are, on average, more value-relevant (Bradshaw and Sloan 2002; Bhattacharya et al. 2003) and fulfill a valuation role (Frankel and Roychowdhury 2005), but there is also evidence of opportunism. For example, Doyle et al. (2003) find that items excluded from non-GAAP earnings have predictive ability for future earnings, cash flows, and abnormal returns, which suggests that these expenses may, in fact, be recurring. In addition, managers appear to use non-GAAP earnings measures to meet earnings benchmarks (Lougee and Marquardt 2004; Bhattacharya et al. 2004; Doyle and Soliman 2005).

In response to concerns regarding the misuse of non-GAAP earnings numbers, the Securities and Exchange Commission (SEC) issued a warning about non-GAAP earnings in 2001, and Section 401(b) of Sarbanes-Oxley (SOX) is devoted to the regulation of non-GAAP usage (Regulation G, hereafter Reg G). The final rule, which took effect March 28, 2003, requires that managers issuing non-GAAP earnings numbers reconcile these figures to the most directly comparable GAAP measure. Recent empirical evidence following these actions by the SEC documents that (1) fewer managers release non-GAAP earnings in their press releases (Marques 2006; Entwistle et al. 2006), and (2) fewer managers are using non-GAAP earnings numbers to meet analyst forecasts (Heflin and Hsu 2005). While the latter result suggests a decrease in the opportunistic use of non-GAAP reporting, the former suggests that this perceived benefit may be offset by a decrease in non-GAAP reporting by firms motivated by a desire to better inform investors. Therefore, the evidence on the costs and benefits associated with SEC intervention into non-GAAP reporting is mixed.

In this paper, we address this question more directly by examining the effect of SEC intervention on the relative quality of exclusions from non-GAAP earnings. Consistent with prior research (Doyle et al. 2003; Gu and Chen 2004; Frankel et al. 2007), we define "high-quality" exclusions as those that are more transitory; i.e., the "appropriate" items are excluded from non-GAAP earnings. We perform three separate, but related, analyses. First, we use our full sample to test whether the quality of exclusions from non-GAAP earnings has, on average, improved following SEC intervention. This finding would be consistent with SEC intervention curtailing the opportunistic behavior of managers.

Second, we triangulate the results from our first set of tests by examining the relative quality of non-GAAP exclusions for the subsample of firms that were frequent non-GAAP reporters prior to SEC intervention and stopped issuing non-GAAP earnings following SEC intervention. Specifically, we test whether the quality of exclusions for this subsample is different from the quality of other firms' exclusions in the period prior to SEC intervention. A finding that the quality of exclusions was lower for the subsample of firms that stopped reporting non-GAAP earnings would suggest that the required transparency imposed by SEC intervention was sufficient to discourage some opportunistically motivated non-GAAP reporters from continuing with this particular disclosure practice.

Third, we split total exclusions into special items (i.e., those items that are typically viewed as nonrecurring by financial statements users)[1] and other exclusions, and examine the relative quality of each component following the SEC intervention. Managers can use either component opportunistically, but there are inherent differences between them. In general, special items are identified as unusual or infrequent in SEC 10-Q and 10-K filings. McVay (2006) finds evidence that managers shift recurring expenses (such as normal severance fees or normal information technology [IT] expenditures) into special items (such as a restructuring charge or Y2K expenses), thereby improving non-GAAP earnings. Following prior research (Doyle et al. 2003), we rely on the Compustat classification of special items, i.e., "unusual or nonrecurring items presented above taxes by the company." Other exclusions are those exclusions from GAAP earnings that were not identified as special items by Compustat. These typically include such expenses as goodwill amortization and R&D expense (Bhattacharya et al. 2004).

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[1] Mulford and Comiskey (2002) observe that the terms "special items" and "nonrecurring items" are often used interchangeably.

Doyle et al. (2003) report that special items have little predictive ability for future performance (i.e., they are "high-quality" exclusions), while other exclusions have significant predictive ability for future performance (i.e., they are "low-quality" exclusions). We examine whether this condition holds in the period following SEC intervention. A significant decrease in the quality of special items following SEC intervention in non-GAAP reporting would be consistent with managers adapting to the new disclosure environment by classifying more recurring items as special items, which may provide greater camouflage for recurring expenses after the required reconciliation.

In order to maximize statistical power and capitalize on the availability of machine-readable data, we use I/B/E/S actual earnings to proxy for the non-GAAP earnings figure issued in press releases by managers, though we acknowledge that this design choice yields evidence that is less direct than would be obtained using actual press release data; we discuss this issue in greater detail in Section III. We examine three samples: the first includes all firms with available data; the second includes only those firm-quarters where I/B/E/S actual and GAAP earnings from continuing operations differ; and the third requires 22 quarters of non-missing data over our time period of 26 quarters to help ensure that our results are not a function of a change in the composition of Compustat or I/B/E/S.

For a sample of 104,954 firm-quarter observations drawn from the second quarter of 1998 through the third quarter of 2004, we find that there has been a significant increase in the quality of exclusions from non-GAAP earnings following the regulatory events governing non-GAAP reporting. In economic terms, prior to SEC intervention $1 of exclusions is associated with 55 cents of expenses over the next four quarters, while after SEC intervention $1 of exclusions is associated with only 24 cents of expenses over the next four quarters, clearly an economically significant improvement in the quality of exclusions. While exclusions are still not perfectly transitory in the post-regulation period, SEC intervention appears to have had the desired effect of mitigating the opportunistic use of non-GAAP earnings numbers.

In comparing the quality of exclusions for a small sample of 28 firms that stopped releasing non-GAAP numbers after SEC intervention with the quality of exclusions for the average non-GAAP earnings discloser, we find that the quality of exclusions for firms that stopped is significantly poorer in the pre-SEC intervention period relative to that of other firms. This suggests that the increased costs of non-GAAP disclosure discouraged at least some opportunistically motivated firms from continuing with this practice, consistent with our main result.[2]

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[2] An alternative explanation for this finding is that, under SFAS No. 142, firms no longer amortize goodwill (and therefore exclude goodwill amortization from non-GAAP earnings). We examine this explanation directly in Section IV; results do not appear to be due to SFAS No. 142.

Finally, in separately examining the quality of the exclusion components (special items and other exclusions), we find that the quality of other exclusions has increased significantly following SEC intervention into non-GAAP reporting. However, we find that the quality of special items has *decreased* following the intervention, which indicates that managers may have adapted to the new scrutiny by shifting more recurring items into special items.[3] Consistent with this view, we further find that a tendency to switch from using other exclusions in the pre-intervention period to special items in the post-intervention period is associated with poorer quality special item exclusions in the latter period. These results suggest that there may be unintended consequences arising from the regulation of non-GAAP disclosures.

These results contribute to the accounting literature in several ways. First, we complement and extend recent findings related to non-GAAP reporting. Both Marques (2006), who obtains non-GAAP figures from press releases, and Heflin and Hsu (2005), who base their sample on I/B/E/S data, investigate the impact of SEC intervention on the frequency of non-GAAP earnings releases. After controlling for known determinants of non-GAAP earning releases, Marques (2006) documents a significant decrease in the frequency of non-GAAP reporting after SEC intervention and also finds that the value-relevance of non-GAAP earnings varies across reporting regimes within her sample. Marques (2006) includes all press releases from 2001–2003 for the S&P 500 in her sample; the final sample size is 361 firms. Thus, Marques' (2006) sample is, by construction, biased toward the largest firms and limited in size, potentially limiting the generalizability of her results.[4]

Heflin and Hsu (2005) undertake a similar analysis of the frequency of non-GAAP reporting and, consistent with Marques (2006), also find evidence of a significant decrease after SEC intervention. However, because Heflin and Hsu (2005) use I/B/E/S actual earnings to proxy for the non-GAAP earnings figures released by managers, as we do in our analysis, their sample size is far larger than in Marques (2006). In addition, Heflin and Hsu (2005) focus on whether the tendency to meet or beat analyst forecasts using non-GAAP earnings releases has changed after SEC intervention. They find that the probability of meeting a forecast is significantly lower in the post-intervention period, which suggests that intervention curbed opportunistic reporting.

In this paper, we take the decreased frequency of non-GAAP reporting documented in prior research as given and instead focus on the relative quality of the exclusions from non-GAAP earnings. Our findings that the average quality has increased and that the firms that stopped releasing non-GAAP earnings tended to have lower quality, on average, in the pre-intervention period are broadly consistent with Heflin and Hsu's (2005) results, though we take a very different methodological approach to the issue.[5] In addition, we provide evidence that the quality of special items has *decreased* following SEC intervention, which suggests that some managers adapted to the new disclosure environment by shifting more recurring expenses into special items.

More generally, we contribute to the literature on the consequences of disclosure regulation, a literature which Healy and Palepu (2001, 412) characterized not long ago as "virtually nonexistent." Several recent papers examine the relative costs and benefits of disclosure regulation. For example, Lo (2003) examines the SEC's 1992 revision of executive compensation disclosure rules and reports evidence consistent with a governance improvement hypothesis. Heflin et al. (2003) examine Regulation Fair Disclosure (Regulation FD) and find some evidence consistent with an improvement in the availability of information to investors, and Bushee and Leuz (2005) find that a regulatory change mandating over-the-counter bulletin board firms to comply with reporting requirements imposes significant costs for smaller firms, but yields significant benefits for others. Our analysis suggests that regulation improved the overall quality of exclusions from non-GAAP earnings, but led some managers to misclassify expenses within the income statement, surely an unintended consequence of the regulation.

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[3] This result is consistent with Entwistle et al. (2006), who report that the frequency of special item exclusions from non-GAAP earnings increased dramatically over 2001–2003 for S&P 500 firms.

[4] Entwistle et al. (2006) also document a decrease in pro forma reporting by S&P 500 companies from 2001–2003.

[5] These results are also consistent with findings reported recently by Yi (2007). Using press release data, Yi (2007) documents evidence that the quality of non-GAAP earnings disclosures has improved following Regulation G.

Last, the paper contributes to the literature related to Sarbanes-Oxley (SOX). This literature has recently exploded, with researchers investigating the effects of SOX on stock prices (Zhang 2007; Li et al. 2008), going-private decisions (Engel et al. 2007), CEO compensation structure (Cohen et al. 2005a), and earnings informativeness (Cohen et al. 2005b), to name but a few of the issues examined. Our evidence on the effect of SEC intervention into non-GAAP reporting contributes to this growing literature.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Prior research documents that non-GAAP earning measures (also known as "pro forma" or "Street" earnings) became increasingly more prevalent during the 1990s. While on average these non-GAAP figures tend to be more value-relevant than GAAP earnings (Bradshaw and Sloan 2002; Bhattacharya et al. 2003), there is also evidence that managers employ these disclosures opportunistically. For example, Doyle et al. (2003) and Gu and Chen (2004) find that items excluded from core earnings have future implications for earnings, cash flows, and abnormal returns, which suggests that these expenses were, in fact, recurring items. Other research shows that non-GAAP earnings measures are used to meet earnings benchmarks (Bhattacharya et al. 2003; Lougee and Marquardt 2004; Doyle and Soliman 2005). Relatedly, Bowen et al. (2005) examine the relative emphasis placed on non-GAAP measures within the earnings release and find that firms emphasize the metric that portrays more favorable firm performance.

In response to concerns that the release of non-GAAP earnings figures might mislead investors by obscuring firms' GAAP results, the SEC issued a warning regarding the use of non-GAAP financial measures in earnings releases in December 2001. The SEC's cautionary advice stated that "presentation of financial results that is addressed to a limited feature of a company's overall financial results ... raises particular concerns ... To inform investors fully, companies need to describe accurately the controlling principles [and] the particular transactions and the kind of transactions that are omitted." The warning also stated that a non-GAAP figure would not be deemed misleading if the company disclosed in plain English how it deviated from GAAP and the amount of each of those deviations.

Additionally, Section 401(b) of Sarbanes-Oxley is devoted to the regulation of non-GAAP usage (Reg G). This rule requires public companies that disclose or release non-GAAP financial measures to include, within that disclosure or release, a presentation of the most directly comparable GAAP financial measure and a quantitative reconciliation, by either schedule or other clearly understandable method, of the disclosed non-GAAP financial measure to the most directly comparable GAAP measure. The final rule took effect March 28, 2003.

The additional reporting requirements for non-GAAP earnings under Reg G have led some firms to abandon the use of non-GAAP earnings measures. Marques (2006) and Heflin and Hsu (2005) find that the SEC's intervention into non-GAAP reporting resulted in a significant decrease in the frequency of non-GAAP earnings reports. Further, Heflin and Hsu (2005) find that non-GAAP earnings figures are less likely to exceed earnings thresholds in the period after these two events, which suggests that SEC intervention may have also curbed the opportunistic use of these disclosures.

We more directly address the question of whether SEC intervention affected the use of non-GAAP earnings measures by examining its effect on the relative quality of exclusions from GAAP earnings, where quality is reflected in the ability of these exclusions to predict future firm performance. We present three separate, but related, hypotheses. First, we examine the overall quality of exclusions from GAAP earnings both before and after SEC intervention. Managers could respond to the SEC actions in a number of ways. As noted in prior research (e.g., Lougee and Marquardt 2004), the decision to release non-GAAP financial measures may be driven by incentives to mislead or to better inform investors. Managers who are motivated by a desire to better inform investors are unlikely to alter the expenses they exclude from GAAP earnings, as they would already be excluding only the most transitory items.

However, this group of managers may decide to stop releasing non-GAAP measures altogether if they expect that the increased costs of non-GAAP disclosure will exceed the benefits. While providing the reconciliation itself should not represent a significant cost, particularly for this group of firms, firms that continue to report pro forma earnings run the risk of censure by the SEC, which is associated with negative stock returns.[6] In addition, there are potential reputation costs if investors now question the motives of managers who release non-GAAP performance measures.

Alternatively, managers who attempt to mislead investors through non-GAAP disclosures are less likely to exclude recurring expenses from GAAP earnings after the SEC actions, as the required reconciliation makes this more obvious to investors. Because the perceived benefit in this case is the obscuring of GAAP results, requiring a reconciliation represents a potential decrease in the benefits of non-GAAP reporting. In addition, the increased costs of non-GAAP reporting, mentioned above, are arguably even greater for this group of firms since the SEC would presumably target firms with a motivation to mislead investors. Given the reduction in the expected net benefit of disclosing non-GAAP figures for this group of firms, it is possible that they will also refrain from releasing non-GAAP measures in the post-Reg G period.

Given the variety of potential managerial responses to the SEC actions, it becomes an empirical question as to whether SEC intervention has had a significant impact on the average quality of exclusions from non-GAAP earnings. We therefore present our first hypothesis in null form:

> **H1:** SEC actions had no effect on the average quality of exclusions from non-GAAP earnings.

Our second hypothesis is motivated by the findings of Heflin and Hsu (2005) and Marques (2006), who document a decrease in the frequency of non-GAAP earnings releases. As discussed above and observed by Entwistle et al. (2006), managers motivated by *either* a desire to mislead or to better inform investors through non-GAAP disclosures may view the costs of disclosure as exceeding the benefits after the SEC actions and stop providing non-GAAP earnings numbers. We explore this issue directly by comparing the quality of exclusions from non-GAAP earnings for the subsample of firms that stopped providing non-GAAP numbers to the average firm using non-GAAP earnings. As with our first hypothesis, we make no directional prediction and present our second hypothesis in null form:

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[6] On January 16, 2002, the SEC instituted cease-and-desist proceedings against Trump Hotels & Casino Resorts Inc. for making misleading statements in an earnings release that highlighted pro forma figures. Trump Hotels experienced abnormal same-day returns of roughly −10 percent.

> **H2:** The quality of exclusions is no different in the pre-intervention period for firms that stopped providing non-GAAP earnings than for other firms.

Evidence that the quality of exclusions is lower in the period preceding the SEC actions for the subsample of firms that stopped providing non-GAAP earnings disclosures is consistent with those firms having been motivated by an intent to mislead investors with their disclosures. Thus, this result would suggest that the SEC's intervention has achieved its intended goals. However, if the quality of exclusions is higher for the subsample of firms that stopped reporting non-GAAP earnings measures, then this would suggest that the requirements imposed by the SEC discouraged firms from providing more informative non-GAAP disclosures to investors.

Our third and final hypothesis addresses the question of whether SEC intervention affected the quality of the components of exclusions from GAAP earnings. Managers can present current period recurring expenses as "transitory" by designating them as special items in their SEC-filed financial statements (McVay 2006) or by labeling them as nonrecurring items within the press release (Doyle et al. 2003; Bhattacharya et al. 2004).[7] Doyle et al. (2003) report that special items have little predictive ability for future performance (i.e., they are high-quality exclusions) while other exclusions have significant predictive ability for future performance (i.e., they are low-quality exclusions). The reconciliation requirement under Reg G would make the exclusion of recurring expenses more obvious to investors. Assuming managers continue to provide non-GAAP disclosures, the new scrutiny would likely result in fewer recurring items excluded from non-GAAP earnings in the press release, thereby increasing the quality of other exclusions. *Ceteris paribus*, it would be unlikely to affect the quality of special items, as these items are, by definition, nonrecurring. This would suggest that any change in the overall quality of exclusions, if there is one, would result from changes in the quality of the other exclusions component of total exclusions.

However, managers might respond to the SEC intervention not by reducing their opportunistic use of total exclusions, but rather by reducing their opportunistic use of other exclusions and increasing their misuse of special items. McVay (2006) reports evidence that managers shift recurring expenses from cost of goods sold and selling, general, and administrative expense into special items in order to manage investor perceptions of core profitability. While special items are audited, the allocation of expenses between permanent and transitory activities is very subjective. For example, a manager might allocate normal IT expenditures to Y2K expenses, or normal severance fees to a restructuring charge. In addition, even upon detection, auditors are less likely to require adjustments when bottom-line earnings are not affected (Nelson et al. 2002), as is the case with this vertical shifting of expenses. This phenomenon may become more pronounced after SEC intervention in non-GAAP reporting because while the reconciliation required under Reg G would highlight the fact that recurring items were excluded from non-GAAP earnings, it would not allow investors to determine whether special items were appropriately classified. Under this scenario, the quality of special items could decline following SEC intervention in non-GAAP reporting.

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[7] Our interest here is in examining how managers classify items as special/nonrecurring. However, because we cannot directly observe managerial intent and rely on Compustat to segregate expenses into Special Items (quarterly data item #32), we necessarily assume that there is a high degree of correspondence between managers' and Compustat's designation of special items. We believe this is a reasonable assumption, particularly since Compustat includes in its Special Items measure any item labeled "special" or "nonrecurring" by the firm, regardless of how frequently it is reported on firms' income statements. We thank an anonymous reviewer for raising this point.

We therefore make no directional predictions regarding changes in the quality of special items and other exclusions following SEC intervention in non-GAAP reporting and present our third hypothesis in null form, as follows:

> **H3:** SEC actions had no effect on the average quality of the components of the exclusions from non-GAAP earnings.

Evidence that the average quality of either special items or other exclusions increased following SEC intervention would be consistent with the intended goals of the regulation. However, evidence that the average quality of special items decreased following SEC intervention would suggest that managers adapted to the new scrutiny by shifting recurring items into special items, which is not consistent with the SEC's objectives.[8]

III. SAMPLE SELECTION, VARIABLE MEASUREMENT, AND DESCRIPTIVE STATISTICS

Sample Selection

As in prior research (e.g., Bradshaw and Sloan 2002; Doyle et al. 2003), we use I/B/E/S actual earnings to proxy for the non-GAAP earnings figure disclosed by managers in press releases. However, we acknowledge that I/B/E/S actual earnings is not a perfect proxy for the figure disclosed in press releases. Analysts do make adjustments to the numbers reported by managers in press releases. For example, Gu and Chen (2004) show that analysts tend to exclude the more transitory items from earnings, and that the nonrecurring items they include in actual earnings are more persistent and have higher valuation multiples than the expenses they exclude from actual earnings. Consistent with these results, Marques (2006) finds that investors rely more on the analyst figure than the press release figure.[9] However, to the extent that analysts already exclude recurring items from non-GAAP earnings, the use of I/B/E/S as our data source biases us toward non-rejection of our null hypotheses. Insignificant results will therefore be especially difficult to interpret given our research design.

We obtain data from the Preliminary History Quarterly Compustat File and I/B/E/S Split-Unadjusted File.[10] Our tests employ the 26 quarters from the second calendar quarter of 1998 through the third calendar quarter of 2004.[11] This time period allows for equal periods (13 quarters) before and after the initial SEC intervention, which we benchmark as mid-2001.[12] The full sample has 104,954 firm-quarter observations with non-missing values for each of the variables needed to test our hypotheses. We also examine two restricted samples. The first restricted sample of 30,955 firm-quarters contain only those observations where non-GAAP earnings and GAAP earnings differ (hereafter, the "non-zero exclusions" sample). The second restricted sample of 52,553 firm-quarters includes those observations where the firm has data for at least 22 of the 26 possible quarters (hereafter, the "constant" sample). We discuss these restricted samples in greater detail in our test design and results.

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[8] An alternative explanation for a decrease in the average quality of special item exclusions would be that Compustat changed its definition of special items in the latter part of our sample period. To rule out this possibility, we contacted S&P directly and were assured that no such change had occurred.

[9] Bhattacharya et al. (2007) find that less sophisticated investors trade more on the manager-adjusted number. Moreover, they are the group of investors most likely to be misled by non-GAAP reporting.

[10] Preliminary History is a newly available dataset (accessible via WRDS) that contains the as-first-filed financial statement figures. Quarterly Compustat routinely overwrites the original values to reflect subsequent discontinued operations and mergers and acquisitions (Standard & Poor's 2003, Ch. 2, p. 9).

Variable Measurement

Non-GAAP Exclusions

We calculate total non-GAAP exclusions as non-GAAP earnings, where non-GAAP earnings is I/B/E/S actual earnings less income before extraordinary items per share (Quarterly Compustat data item #19 or #9, depending on the reported basis of the I/B/E/S actual earnings).[13] Following Doyle et al. (2003), we decompose total non-GAAP exclusions into special items and other exclusions. Special items are defined as earnings per share from operations (Quarterly Compustat data item #177) less GAAP earnings per share (data item #19).[14] Other exclusions are defined as total exclusions less special items.[15] For example, a firm with GAAP earnings per share of 0.20, non-GAAP earnings of 0.25, and special items of 0.03 would have total exclusions of 0.05 (non-GAAP earnings 0.25 less GAAP earnings 0.20), and other exclusions of 0.02 (total exclusions of 0.05 less special items of 0.03). Positive values of total exclusions, special items, and/or other exclusions indicate that income-decreasing expenses were excluded from GAAP earnings.

Dependent Variable

Our dependent variable is future operating income, defined as earnings per share from operations (data item #177) summed over four quarters starting with quarter $q+1$. We believe this dependent variable is best suited for examining our research questions because operating income as defined by Compustat excludes nonrecurring special items but includes recurring items that might appear in firms' "other exclusions" from non-GAAP earnings. As such, it best approximates the concept of "permanent earnings."

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[11] Actual data requirements are from the second calendar quarter of 1996 through the third quarter of 2005, as our tests require four subsequent quarters of future earnings realizations to test the quality of non-GAAP exclusions and up to two years of historical data is required to calculate earnings volatility (one of our control variables). We define these variables in Section III.

[12] While the official SEC warning was not until December 2001, it was public knowledge that the SEC was concerned with non-GAAP reporting before that time. In addition, the Financial Executives Institute and the National Investor Relations Institute jointly issued guidelines for the use of pro forma earnings in press releases in April 2001. Results are not sensitive to the exact time cutoff; we provide several robustness checks in Section IV.

[13] After calculating total exclusions, all variables are transformed to be on a per basic share basis. For example, if the I/B/E/S actual is reported on diluted share basis, total exclusions is calculated as Compustat quarterly data item #9 minus I/B/E/S actual and the three variables are multiplied by the ratio of basic earnings per share to diluted earnings per share, both before extraordinary items, as reported by Compustat quarterly (item #19/item #9), or the dilution factor provided by I/B/E/S if item #9 or item #19 is missing or zero.

[14] To prevent the artificial creation of other exclusions, we do not allow special items to exceed total exclusions (in absolute terms) and set special items to zero if total exclusions is zero.

[15] Compustat "earnings per share from operations" (Compustat data item #177) removes the effects of all nonrecurring events from basic earnings per share. As previously noted, in decomposing total exclusions into special items and other exclusions, our intent is to capture a classification scheme devised by managers; i.e., managers decide on whether they would like a particular item to be viewed as nonrecurring by financial statement users. However, we rely on Compustat for this partitioning.

There are a number of alternative dependent variables, including future GAAP earnings, future non-GAAP earnings, future operating cash flows, future free cash flows, and future returns. Each of these alternatives presents their own particular interpretation difficulties. For example, future GAAP earnings is likely to be mechanically related to current exclusions because, as shown by Francis et al. (1996), past special items (a component of exclusions) are a strong predictor of current special items (a component of GAAP earnings). Thus, the ability of exclusions to predict future GAAP earnings may not reflect the appropriateness of the exclusion but simply the relation between current and future write-offs. As this criticism does not apply to the other exclusions component of total exclusions, which is the component containing the majority of the recurring expenses in the pre-intervention period (Doyle et al. 2003), we replicate our analyses using future GAAP earnings as a robustness check in Section IV.

The use of non-GAAP earnings as the dependent variable would introduce other difficulties because managers or analysts may exclude the same items from non-GAAP earnings in each quarter. To the extent that this occurs, the exclusion, whether it is appropriately taken or not, will have no predictive ability for future non-GAAP earnings; i.e., all exclusions will be judged as perfectly transitory. Because this will wrongly characterize the nature of recurring item exclusions, we reject the use of non-GAAP earnings as our dependent variable.

Doyle et al. (2003) use cash flow from operations and free cash flows as their main dependent variables. These dependent variables are not desirable since current liabilities have future cash flow implications. Consider, for example, expenses that are incurred but not paid. These expenses are paid in future quarters, resulting in a mechanical relation between exclusions from permanent earnings and future cash flows (see also Easton 2003).

Finally, Doyle et al. (2003) corroborate their cash flow results using future returns, arguing that if investors fully understand the implications of current exclusions on future earnings and cash flows, then these exclusions should not be associated with future returns. However, using future returns as the dependent variable is problematic over our sample period because Bowen et al. (2005) find that the emphasis placed on non-GAAP earnings within press releases changed after the actions by the SEC. They also find evidence suggesting that the change in emphasis affected the pricing of non-GAAP earnings. The confounding effect of the change in disclosure practices, along with the possibility of a shift in investor sentiment, makes future returns an unattractive candidate as a dependent variable.

Given the limitations of each of these alternative dependent variables, we use future operating income as the main variable of interest in our hypothesis tests.

Control Variables

We include six control variables in our main regressions. First, following Frankel et al. (2007), we include sales growth, total assets, earnings volatility, a loss indicator, and the book-to-market assets ratio, each of which are expected to be correlated with both non-GAAP earnings use and future earnings.[16] We also include the age of the firm, as we are examining the use of non-GAAP earnings over time and want to control for any effects of a firm's maturation process on non-GAAP earnings use and future earnings. Our control variables are defined as follows, with Compustat quarterly data item numbers in parentheses: sales growth is the increase in sales, scaled by shares outstanding ([#2$_q$ – #2$_{q-4}$]/#15). Total assets is the firm's total assets (#44) at the end of quarter q. Earnings volatility is the standard deviation of return on assets (#25/#44) over at least six of the eight preceding quarters. Loss is an indicator variable equal to 1 if GAAP earnings (#25) in quarter q is less than 0, and 0 otherwise. Book-to-market assets is the book value of equity divided by the book value of debt plus market value of equity (#60/[#54 + #61 × #14]). Age is the number of years since the company first appeared in Compustat. We use the log of total assets and age in our regressions as these variables are highly skewed. To control for scale effects in the regressions, we divide future operating income, non-GAAP earnings, non-GAAP exclusions, special items, other exclusions, and sales growth by total assets per share (#44/#15), where assets per share is required to be positive.[17] We exclude the extreme 1 percent at each end of the distribution of each of the continuous variables (with the exception of the bottom 1 percent of age) to avoid undue influence by outliers.

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[16] Doyle et al. (2003) include two control variables (sales growth and accruals) in their analysis. However, their dependent variable is cash flows, while ours is earnings. As such, we follow Frankel et al. (2007) who also use earnings as their dependent variable. Results are not sensitive to the use of the Doyle et al. (2003) control variables or the exclusion of control variables.

Descriptive Statistics

Table 1 presents descriptive statistics for each of our three samples. For the main sample, the mean (median) GAAP earnings per share is 0.147 (0.140) and non-GAAP earnings per share is 0.186 (0.160). These averages are somewhat lower than those in Doyle et al. (2003), who report mean (median) GAAP earnings of 0.26 (0.23) and "Street" earnings of 0.29 (0.25). However, our sample period of 1998–2004 includes a higher (lower) proportion of calendar quarters that are defined as business cycle contraction (expansion) periods by the National Bureau of Economic Research, consistent with the lower levels of reported profitability. Mean total exclusions for our sample are slightly higher at 0.039 versus 0.03 in Doyle et al. (2003), which is consistent with the increased frequency of non-GAAP reporting over time documented by Bhattacharya et al. (2004) and others.

Comparing across the three samples, GAAP earnings is lower in the non-zero exclusions sample, consistent with these firms having losses or special items (Lougee and Marquardt 2004). Interestingly, non-GAAP earnings for the non-zero exclusions sample are very similar to non-GAAP earnings for the full sample, consistent with this measure representing "core" earnings. GAAP earnings for the constant sample is higher, and the firms are older, consistent with the data requirement that the firm have data for at least 22 of the 26 quarters examined.

Table 2 presents univariate tests of variable differences across our two sample periods, 1998 Q2–2001 Q2 and 2001 Q3–2004 Q3. Mean GAAP earnings are slightly lower in the earlier time period (0.139 versus 0.154), though median GAAP earnings are higher in the earlier time period (0.150 versus 0.120). Mean non-GAAP earnings are very similar across the two periods, while median non-GAAP earnings fall from 0.170 to 0.140. Mean total exclusions fall significantly from 0.042 to 0.037 ($p = 0.001$), suggesting that SEC intervention reduced the magnitude of the differences between GAAP and non-GAAP earnings. Both special items and other exclusions have declined, though the magnitude of the other exclusions decline appears larger. Future operating income appears to have improved significantly over time, increasing from 0.560 to 0.825 ($p = 0.001$). Finally, earnings

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[17] Since those variables are initially presented on per share basis, dividing by assets per share is equivalent to scaling each variable by total assets.

TABLE 1
Descriptive Statistics

	Full Sample (104,954 firm-quarters/7,904 firms)			Non-Zero Exclusions (30,955 firm-quarters/6,135 firms)			Constant Sample (52,553 firm-quarters/2,126 firms)		
Variable	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**
GAAP Earnings	0.147	0.140	0.482	0.064	0.080	0.619	0.239	0.220	0.476
Non-GAAP Earnings	0.186	0.160	0.395	0.198	0.160	0.420	0.278	0.240	0.395
Total Exclusions	0.039	0.000	0.207	0.134	0.040	0.364	0.039	0.000	0.206
Special Items	0.025	0.000	0.135	0.088	0.000	0.238	0.027	0.000	0.143
Other Exclusions	0.014	0.000	0.104	0.046	0.000	0.188	0.012	0.000	0.096
Future Operating Inc.	0.692	0.620	1.636	0.665	0.580	1.839	1.105	1.000	1.529
Sales Growth	0.387	0.160	1.449	0.376	0.163	1.653	0.497	0.252	1.585
Total Assets	2,083	359	6,084	3,376	675	8,158	2,646	585	6,351
Earnings Volatility	0.026	0.011	0.044	0.028	0.012	0.047	0.016	0.008	0.024
Loss	0.300	0.000	0.458	0.392	0.000	0.488	0.206	0.000	0.405
Book-to-Market Assets	0.331	0.279	0.253	0.334	0.279	0.256	0.317	0.280	0.209
Age	15.057	11.000	11.558	15.240	10.000	12.154	18.345	14.000	12.602

The sample covers the second quarter of 1998 through the third quarter of 2004 (1998 Q2–2004 Q3). Compustat quarterly data items are in parentheses.

Variable Definitions:

GAAP Earnings = (basic) earnings per share before extraordinary items and discontinued operations (#19);
Non-GAAP Earnings = I/B/E/S reported actual (basic) earnings per share;
Total Exclusions = *Non-GAAP Earnings* less *GAAP Earnings*;
Special Items = *Operating Income* less *GAAP Earnings*, where *Operating Income* is operating income per share (#177);
Other Exclusions = *Total Exclusions* less *Special Items*; a positive value of *Total Exclusions*, *Special Items*, and/or *Other Exclusions* indicates an income-decreasing expense was excluded from *GAAP Earnings*;
Future Operating Income = *Operating Income* summed over four quarters starting with quarter $q+1$;
Sales Growth = quarter-over-quarter increase in sales, on a per share basis ($[\#2_q - \#2_{q-4}]/\#15$);
Total Assets (#44) = in millions and corresponds to quarter q;
Earnings Volatility = standard deviation of return on assets (#25/#44) over at least six of the preceding eight quarters;
Loss = an indicator variable equal to 1 if earnings before extraordinary items for the quarter (#25) is less than 0, and 0 otherwise;
Book-to-Market Assets = book value of equity divided by the book value of debt plus market value of equity (#60/[#54 + #61 × #14]); and
Age = number of years since the company first appeared in Compustat.

All continuous variables (with the exception of the lower bound of age) are truncated at 1 percent and 99 percent. *GAAP Earnings*, *Non-GAAP Earnings*, *Total Exclusions*, *Special Items*, *Other Exclusions*, and *Sales Growth* are scaled by assets per basic share outstanding (#44/#15) in the correlation matrix and regression results.

TABLE 2
Descriptive Statistics for Time Subgroups

Variable	1998 Q2 through 2001 Q2 (52,601 firm-quarters/6,468 firms) Mean	Median	2001 Q3 through 2004 Q3 (52,353 firm-quarter /6,072 firms) Mean	Median	Two-Tailed p-value for Statistical Difference of the Means under a t-test/Wilcoxon Rank Sum Test
GAAP Earnings	0.139	0.150	0.154	0.120	0.001/0.001
Non-GAAP Earnings	0.181	0.170	0.191	0.140	0.001/0.001
Total Exclusions	0.042	0.000	0.037	0.000	0.001/0.001
Special Items	0.025	0.000	0.024	0.000	0.140/0.001
Other Exclusions	0.017	0.000	0.013	0.000	0.001/0.001
Future Operating Income	0.560	0.610	0.825	0.630	0.001/0.001
Sales Growth	0.525	0.257	0.248	0.085	0.001/0.001
Total Assets	1,724	315	2,444	414	0.001/0.001
Earnings Volatility	0.025	0.011	0.028	0.011	0.001/0.041
Loss	0.290	0.000	0.311	0.000	0.001/0.001
Book-to-Market Assets	0.324	0.272	0.337	0.285	0.001/0.001
Age	14.196	9.000	15.923	11.000	0.001/0.001

There are a total of 104,954 firm-quarters and 7,904 firms.
See Table 1 for additional information.

volatility and losses are higher in the later part of the sample, suggesting that, all else equal, non-GAAP earnings use is expected to increase (Lougee and Marquardt 2004), though, as noted above, the magnitude of total exclusions has declined.

Table 3 presents a correlation matrix among the main variables. We find that total exclusions are negatively correlated with GAAP earnings (the Pearson correlation coefficient, ρ, is -0.425), which is consistent with prior evidence that non-GAAP reporting is more likely when earnings performance is poor. We also find that future operating income appears more positively correlated with non-GAAP earnings ($\rho = 0.777$) than it is with GAAP earnings ($\rho = 0.754$), which is consistent with previous evidence that non-GAAP earnings are more permanent than GAAP earnings and thus more value-relevant. However, we also observe that total exclusions are negatively correlated with future operating income ($\rho = -0.144$), consistent with the notion that non-GAAP earnings may exclude expenses that have implications for future earnings.

IV. EMPIRICAL TESTS AND RESULTS

Hypothesis 1

We first test H1—there is no difference in the average quality of exclusions from GAAP earnings following SEC intervention into non-GAAP reporting. Following Doyle et al. (2003) and Gu and Chen (2004), we define high-quality exclusions to be those that have the least predictive power for future earnings and estimate the following pooled regression:

TABLE 3
Spearman\Pearson Correlation Matrix

	GAAP Earnings	*Non-GAAP Earnings*	*Total Excl.*	*Special Items*	*Other Excl.*	*Future Operating Income*	*Sales Growth*	*Log (Total Assets)*	*Earnings Volatility*	*Loss*	*Book-to-Market Assets*	*Log (Age)*
GAAP Earnings		0.943 (0.001)	−0.425 (0.001)	−0.348 (0.001)	−0.328 (0.001)	0.754 (0.001)	0.246 (0.001)	0.289 (0.001)	−0.405 (0.001)	−0.651 (0.001)	−0.079 (0.001)	0.181 (0.001)
Non-GAAP Earnings	0.946 (0.001)		−0.099 (0.001)	−0.076 (0.001)	−0.083 (0.001)	0.777 (0.001)	0.237 (0.001)	0.304 (0.001)	−0.392 (0.001)	−0.605 (0.001)	−0.053 (0.001)	0.166 (0.001)
Total Exclusions	−0.272 (0.001)	−0.069 (0.001)		0.833 (0.001)	0.756 (0.001)	−0.144 (0.001)	−0.092 (0.001)	−0.039 (0.001)	0.146 (0.001)	0.301 (0.001)	0.091 (0.001)	−0.087 (0.001)
Special Items	−0.199 (0.001)	−0.045 (0.001)	0.610 (0.001)		0.267 (0.001)	−0.071 (0.001)	−0.078 (0.001)	−0.017 (0.001)	0.085 (0.001)	0.233 (0.001)	0.065 (0.001)	−0.047 (0.001)
Other Exclusions	−0.226 (0.001)	−0.067 (0.001)	0.837 (0.001)	0.222 (0.001)		−0.167 (0.001)	−0.067 (0.001)	−0.048 (0.001)	0.154 (0.001)	0.249 (0.001)	0.081 (0.001)	−0.097 (0.001)
Future Op. Income	0.750 (0.001)	0.757 (0.001)	−0.121 (0.001)	−0.050 (0.001)	−0.135 (0.001)		0.182 (0.001)	0.301 (0.001)	−0.390 (0.001)	−0.545 (0.001)	−0.063 (0.001)	0.196 (0.001)
Sales Growth	0.366 (0.001)	0.376 (0.001)	−0.060 (0.001)	−0.040 (0.001)	−0.054 (0.001)	0.308 (0.001)		0.008 (0.009)	−0.073 (0.001)	−0.222 (0.001)	−0.138 (0.001)	−0.059 (0.001)
Log (Total Assets)	0.161 (0.001)	0.162 (0.001)	0.023 (0.001)	0.078 (0.001)	−0.008 (0.008)	0.189 (0.001)	−0.019 (0.001)		−0.346 (0.001)	−0.284 (0.001)	−0.305 (0.001)	0.238 (0.001)
Earnings Volatility	−0.246 (0.001)	−0.210 (0.001)	0.123 (0.001)	0.070 (0.001)	0.119 (0.001)	−0.227 (0.001)	0.007 (0.032)	−0.497 (0.001)		0.362 (0.001)	0.074 (0.001)	−0.173 (0.001)
Loss	−0.794 (0.001)	−0.720 (0.001)	0.282 (0.001)	0.214 (0.001)	0.229 (0.001)	−0.571 (0.001)	−0.227 (0.001)	−0.288 (0.001)	0.460 (0.001)		0.166 (0.001)	−0.161 (0.001)
Book-to-Market Assets	−0.008 (0.001)	0.005 (0.097)	0.050 (0.001)	0.029 (0.001)	0.045 (0.001)	−0.008 (0.007)	−0.071 (0.001)	−0.306 (0.001)	0.240 (0.001)	0.122 (0.001)		−0.008 (0.001)
Log (Age)	0.179 (0.001)	0.168 (0.001)	−0.065 (0.001)	−0.019 (0.001)	−0.079 (0.001)	0.208 (0.001)	−0.051 (0.001)	0.216 (0.001)	−0.148 (0.001)	−0.162 (0.001)	0.031 (0.001)	

There are a maximum of 104,954 firm-quarters for 7,904 firms for each variable.

See Table 1 for additional information.

$$
\begin{aligned}
\textit{Future Operating Income}_{q+1,\,q+4} = {} & \alpha_0 + \alpha_1 \textit{Non-GAAP Earnings}_q \\
& + \alpha_2 \textit{Non-GAAP Exclusions}_q + \alpha_3 \textit{POST} \\
& + \alpha_4 \textit{Non-GAAP Exclusions}_q \times \textit{POST} \\
& + \alpha_5 \textit{Sales Growth} + \alpha_6 \textit{Log(Total Assets)} \\
& + \alpha_7 \textit{Earnings Volatility} + \alpha_8 \textit{Loss} \\
& + \alpha_9 \textit{Book-to-Market Assets} \\
& + \alpha_{10} \textit{Log(Age)} + \upsilon_{q+1,\,q+4} \qquad (1)
\end{aligned}
$$

where *POST* is an indicator variable that equals 1 if the observation falls between Q3 2001 and Q3 2004 (inclusive), and 0 otherwise; all other variables are as defined earlier. We estimate least squares regressions and allow errors to cluster by CUSIP to account for any residual dependence created by firm effects, as Petersen (2005) shows that this method yields unbiased standard errors. We also include time and industry fixed effects, where industries are defined using the Fama-French 48 industry classification (Fama and French 1997). Because all variables are denominated in dollars and scaled by total assets, the coefficients in Equation (1) can be interpreted as the future-dollar-earnings implication of a dollar change in the unscaled independent variable (Doyle et al. 2003, 153).

Results are presented in Table 4. First, α_1 is 2.44, where perfectly permanent earnings would have an estimated coefficient of 4.00. Turning to our second independent variable, Doyle et al. (2003) document a negative relation between non-GAAP exclusions and future performance, which they interpret as evidence that the excluded items are recurring; therefore we expect α_2 to be negative. Referring to Table 4, α_2 is -0.55; consistent with Doyle et al. (2003), the non-GAAP exclusions are not perfectly transitory, but on average are more transitory than core earnings. One dollar of excluded expenses this quarter is expected to result in 55 cents of expenses over the next four quarters.

If SEC intervention into non-GAAP reporting has improved the quality of exclusions, then this relation should be less negative in the later time period, i.e., the exclusions should be more transitory. We examine the interaction between *POST* and *Non-GAAP Exclusions* to shed light on H1. Focusing first on our full sample, α_4 is 0.31, suggesting that there has been a large improvement in the quality of exclusions from non-GAAP earnings following SEC scrutiny of non-GAAP reporting (i.e., the exclusions are more transitory). In economic terms, prior to SEC intervention, $1 of exclusions is associated with 55 cents of expenses over the next four quarters, as described above. After SEC intervention, $1 of exclusions is associated with 24 cents of expenses over the next four quarters ($-0.55 + 0.31$). This decline is also apparent in our non-zero exclusions sample, but we find that α_4 is insignificant in our constant sample. Thus, we provide some evidence that exclusions have improved in quality following SEC intervention.

Hypothesis 2

We next test H2—the quality of non-GAAP exclusions is no different for firms that stopped releasing non-GAAP earnings following the SEC intervention compared to the average firm. We identify "stopped" firms as those that have non-zero exclusions in more than 50 percent of their quarterly observations prior to mid-2001, but have no exclusions

TABLE 4
Model of Future Operating Income on Exclusions and Control Variables

Dependent Variable: *Future Operating Income*

		Full Sample	Non-Zero Exclusions	Constant Sample
Independent Variables	**Predicted Sign**	**Coefficient (t-statistic)**	**Coefficient (t-statistic)**	**Coefficient (t-statistic)**
Intercept		−0.01	0.00	0.03
		(−1.41)	(0.10)	(2.04)
Non-GAAP Earnings	+	2.44	2.33	2.57
		(72.34)	(40.23)	(34.33)
Non-GAAP Exclusions	−	−0.55	−0.55	−0.29
		(−8.35)	(−8.42)	(−3.66)
POST		0.01	0.00	−0.00
		(4.81)	(0.66)	(−0.55)
Non-GAAP Exclusions × *POST*	+	0.31	0.29	0.07
		(4.29)	(3.94)	(0.90)
Sales Growth		−0.01	−0.02	0.01
		(−0.68)	(−1.60)	(1.41)
Log (Total Assets)		0.00	0.00	−0.00
		(8.56)	(3.52)	(−1.10)
Earnings Volatility		−0.24	−0.22	−0.24
		(−12.62)	(−8.79)	(−6.60)
Loss		−0.03	−0.02	−0.01
		(−16.26)	(−11.88)	(−4.15)
Book-to-Market Assets		−0.01	−0.02	−0.02
		(−2.56)	(−4.05)	(−5.78)
Log (Age)		0.01	0.01	0.00
		(10.30)	(8.01)	(5.33)
Time Fixed Effects		Included	Included	Included
Industry Fixed Effects		Included	Included	Included
R^2		63.38%	54.79%	62.67%
Number of Firm-Quarters		104,954	30,955	52,553
Number of Firms		7,904	6,135	2,126

POST = an indicator variable that is equal to 1 if the firm-quarter observation occurs between 2001 Q3 and 2004 Q3 (inclusive), and 0 if the firm-quarter observation occurs between 1998 Q2 and 2001 Q2 (inclusive).

Each regression includes time fixed effects and industry fixed effects defined over the Fama-French 48 industry classification. The errors are allowed to cluster by CUSIP.

See Table 1 for additional information.

from GAAP earnings in any of their quarterly observations following SEC scrutiny.[18,19]

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[18] Results are similar using varying cutoffs. Among others, we considered at least 60 percent usage before and 0 percent usage after SEC scrutiny. This cutoff decreases the sample size somewhat (22 firms for the full sample), but does not materially affect the statistical inferences. The sample of "stoppers" increases dramatically if we allow for limited post-SEC non-GAAP disclosures following extensive use in the pre-scrutiny period (e.g., at least 65 percent usage prior to the SEC scrutiny, but less than 35 percent usage following the scrutiny). Results are similar.

[19] We require that a firm has at least three observations in both the pre- and post-SEC intervention periods, to assure that results are not driven by firms that are removed from the Quarterly Compustat file.

Within our full sample, we identify 28 firms as "stoppers" in the pre-SEC intervention period. We present descriptive statistics for our stopped sample both for the full sample (389 firm-quarters) and across the two time periods in Table 5. Mean GAAP earnings, on average, are lower than in our full sample, but are similar to the non-zero exclusions sample from Table 1. Turning to the split between the two time-periods, the earnings appear to be lower in the earlier period, though this difference is not statistically significant. Total exclusions in the pre-period are 0.086 versus, by construction, 0.000 in the post-period. Sales growth declines dramatically over the two periods, and merger and acquisition (M&A) activity also falls; therefore, we add M&A as an additional control variable in our tests of H2.

To shed light on the types of items that the stoppers are excluding and on the transparency of their disclosures, we collect for each firm in our stopper sample one press release from a single quarter with non-zero total exclusions and one press release from a control firm matched on calendar quarter-year, industry, and the use of non-GAAP earnings (per I/B/E/S). For these 56 firms, we search Factiva for their earnings press releases.[20] We first examine whether non-GAAP earnings is reconcilable to GAAP earnings. In the instances where the press releases contain a non-GAAP earnings number, we are able to reconcile non-GAAP to GAAP earnings for 55 percent of our test firms and 71 percent of our control firms, consistent with stoppers providing less transparent disclosures.

Second, while it is difficult to neatly categorize the wide variety of items that non-GAAP disclosers exclude from reported earnings (see Bhattacharya et al. [2004] or Entwistle et al. [2006] for lists of "typical" exclusions), there is some evidence that the types of items excluded from non-GAAP earnings vary between our test and control firms. For example, stoppers exclude amortization of goodwill and other intangibles more often than control firms (20 percent for test firms versus 4.8 percent for control firms) and also exclude compensation charges more frequently (15 percent versus 9.5 percent). However, stoppers are not more likely to exclude merger and acquisition charges (35 percent versus 38.1 percent) or restructuring charges (20 percent versus 19 percent) than control firms. This suggests that stoppers are more likely to use their reporting discretion to exclude recurring charges, but are equally likely as non-stoppers to exclude one-time items that are economically driven. This descriptive analysis provides some preliminary evidence on H2. Stoppers appear to provide less transparent disclosures and exclude recurring charges more often than their industry peers. However, this analysis is purely descriptive; we now turn to our statistical tests of H2.

To test H2, we examine the differential quality of the exclusions for stoppers relative to the full sample. Thus, we estimate the following pooled regression from the second quarter of 1998 through the second quarter of 2001 (i.e., we restrict the sample to the pre-SEC intervention period):

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[20] We select the first available observation in 1999 and in one instance take the observation from the fourth quarter of 1998 (as we want to unambiguously precede the SEC scrutiny). We are able to find 25 press releases for the control firms, and 24 press releases and one newswire earnings announcement summary for the sample of stoppers. We are able to identify non-GAAP earnings in 21 (20) of the control firms' (stoppers') press releases. This finding is consistent with Bhattacharya et al. (2003) and Gu and Chen (2004): analysts sometimes make adjustments to earnings that managers do not explicitly incorporate in the press release.

TABLE 5
Descriptive Statistics for the "Stopped" Sample (28 firms)

	Full Stopped Sample (389 firm-quarters)		1998 Q2 through 2001 Q2 (199 firm-quarters)		2001 Q3 through 2004 Q3 (190 firm-quarters)		Two-Tailed p-value for Statistical Difference of the Means under a t-test/Wilcoxon Rank Sum Test
Variable	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**	
GAAP Earnings	0.044	0.040	0.030	0.050	0.058	0.040	0.379/0.953
Non-GAAP Earnings	0.086	0.050	0.112	0.090	0.058	0.040	0.043/0.020
Total Exclusions	0.042	0.000	0.082	0.010	0.000	0.000	0.001/0.001
Special Items	0.020	0.000	0.040	0.000	0.000	0.000	0.001/0.001
Other Exclusions	0.022	0.000	0.042	0.000	0.000	0.000	0.001/0.001
Future Operating Inc.	0.273	0.190	0.208	0.220	0.342	0.190	0.250/0.950
Sales Growth	0.388	0.114	0.681	0.262	0.080	0.022	0.001/0.001
Total Assets	1,574	135	2,240	188	877	105	0.025/0.001
Earnings Volatility	0.048	0.023	0.037	0.017	0.058	0.029	0.002/0.021
Loss	0.357	0.000	0.362	0.000	0.353	0.000	0.851/0.851
Book-to-Market Assets	0.356	0.265	0.335	0.242	0.378	0.291	0.163/0.027
Age	11.298	9.000	10.156	9.000	12.495	9.500	0.001/0.001
M&A	0.013	0.000	0.025	0.000	0.000	0.000	0.025/0.028

Stopped firms are those that have a difference between GAAP and non-GAAP earnings in more than 50 percent of the quarters prior to the SEC scrutiny and in none of the quarters in the post-SEC scrutiny period. We require at least three quarters of data both prior to and after the SEC intervention for a firm to be included in the "stopped" sample. There are 28 individual firms in the full sample that fit this description.

M&A = an indicator variable equal to 1 if the Sales footnote in Compustat quarterly (QFTNT1) indicates M&A activity (takes a value of "AA" or "AB"), and 0 otherwise.

See Table 1 for additional information.

$$
\begin{aligned}
\mathit{Future\ Operating\ Income}_{q+1,\ q+4} = {} & \beta_0 + \beta_1 \mathit{Non\text{-}GAAP\ Earnings}_q \\
& + \beta_2 \mathit{Non\text{-}GAAP\ Exclusions}_q + \beta_3 \mathit{STOP} \\
& + \beta_4 \mathit{Non\text{-}GAAP\ Exclusions}_q \times \mathit{STOP} \\
& + \beta_5 \mathit{Sales\ Growth} + \beta_6 \mathit{Log(Total\ Assets)} \\
& + \beta_7 \mathit{Earnings\ Volatility} + \beta_8 \mathit{Loss} \\
& + \beta_9 \mathit{Book\text{-}to\text{-}Market\ Assets} \\
& + \beta_{10} \mathit{Log(Age)} + \beta_{11} \mathit{M\&A} + \upsilon_{q+1,\ q+4} \qquad (2)
\end{aligned}
$$

where *STOP* is an indicator variable that is equal to 1 if the firm used non-GAAP reporting in more than 50 percent of the quarters prior to SEC intervention (i.e., in the period examined in this test), and none of the quarters following SEC intervention. As with Equation (1), we estimate least squares regressions and allow errors to cluster by CUSIP. We again include time and industry fixed effects.

Full sample results are presented in the left-hand column of Table 6. First, β_1 is 2.46, which is almost identical to the coefficient of 2.44 in Table 4. Interestingly, the main effect of non-GAAP exclusions, β_2, is only -0.41 compared to -0.55 in Table 4. The reason becomes obvious as we turn to our coefficient of interest, β_4, which is -1.30. Those firms that stopped reporting non-GAAP earnings following SEC intervention had lower quality exclusions than the average firm reporting non-GAAP earnings in the period prior to SEC intervention; the exclusions of "stop" firms are expected to be associated with \$1.71 of expenses over the next four quarters ($-0.41 + -1.30$). We replicate this test for our non-zero exclusions sample and our constant sample; results are consistent for both of these alternative samples. Overall, our results suggest that the firms that stopped reporting non-GAAP financial measures had the lowest quality exclusions prior to the SEC scrutiny, suggesting they had been using these disclosures opportunistically.[21] These results have important implications for regulators, as it appears that SEC oversight was effective, at least in part, in curtailing the misuse of non-GAAP reporting. These results also complement findings by Heflin and Hsu (2005), who find that firms are less likely to meet earnings benchmarks using non-GAAP earnings numbers in the period following the SEC's actions.[22]

Hypothesis 3

Hypothesis 3 examines whether SEC intervention in non-GAAP reporting affects the quality of the exclusion components. We therefore decompose total exclusions into special items and other exclusions and estimate the following pooled regression:

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[21] It is possible that high-exclusion-usage firms are going through a transitional period that is unrelated to SEC scrutiny but results in lower quality exclusions. Thus, we examine firms that "started" using non-GAAP earnings. Starters are those that had more than 50 percent usage in the post-period but zero usage in the pre-period (33 firms). We then re-estimate model (2) in the post period finding that the results are not significant, β_4 is -0.34 (t-statistic $= -0.86$).

[22] To obtain further descriptive evidence on H2, we also calculated statistics on the frequency of using non-GAAP earnings to meet two common earnings benchmarks. Consistent with Heflin and Hsu (2005), we find that the 28 stopper firms were more likely than test firms to use non-GAAP earnings to exceed four-quarters-ago GAAP earnings (25 percent versus 14.8 percent) or avoid a loss (21.4 percent versus 14.3 percent).

TABLE 6
Model of Future Operating Income on Exclusions and Stopped Firms

Dependent Variable: *Future Operating Income*

Independent Variables	**Predicted Sign**	**Full Sample** **Coefficient (t-statistic)**	**Non-Zero Exclusions** **Coefficient (t-statistic)**	**Constant Sample** **Coefficient (t-statistic)**
Intercept		−0.01 (−0.88)	0.00 (0.16)	0.02 (1.37)
Non-GAAP Earnings	+	2.46 (56.54)	2.19 (29.98)	2.71 (25.95)
Non-GAAP Exclusions	−	−0.41 (−6.22)	−0.44 (−6.36)	−0.27 (−3.38)
STOP		0.01 (0.63)	0.01 (0.68)	0.03 (2.28)
Non-GAAP Exclusions × *STOP*	−	−1.30 (−2.20)	−1.31 (−2.13)	−1.58 (−4.40)
Sales Growth		−0.03 (−2.79)	−0.07 (−4.00)	−0.01 (−0.77)
Log (Total Assets)		0.00 (6.22)	0.00 (2.25)	−0.00 (−1.74)
Earnings Volatility		−0.36 (−11.11)	−0.38 (−8.26)	−0.22 (−4.41)
Loss		−0.03 (−12.75)	−0.03 (−9.96)	−0.01 (−1.83)
Book-to-Market Assets		0.00 (0.13)	−0.01 (−1.63)	−0.01 (−2.75)
Log (Age)		0.01 (8.17)	0.01 (7.42)	0.01 (5.27)
M&A		0.01 (2.32)	0.01 (1.01)	0.00 (0.47)
Time Fixed Effects		Included	Included	Included
Industry Fixed Effects		Included	Included	Included
R^2		62.40%	52.46%	62.43%
Stopped Firms		28	28	2
Stopped Firm-Quarters		199	138	26
Number of Firms		6,468	4,766	2,126
Number of Firm-Quarters		52,601	14,475	26,356

STOP = indicator variable that is equal to 1 if there was a difference between GAAP and non-GAAP earnings in more than 50 percent of the quarters prior to the SEC scrutiny and a difference in none of the quarters in the post-SEC scrutiny period; and

M&A = indicator variable equal to 1 if there was a merger or acquisition in the period, and 0 otherwise.

Each regression includes time fixed effects and industry fixed effects defined over the Fama-French 48 industry classification. The errors are allowed to cluster by CUSIP.

See Table 1 for additional information.

$$\begin{aligned}\textit{Future Operating Income}_{q+1,\,q+4} = {} & \gamma_0 + \gamma_1 \textit{Non-GAAP Earnings}_q \\ & + \gamma_2 \textit{Special Items}_q \\ & + \gamma_3 \textit{Other Exclusions}_q + \gamma_4 \textit{POST} \\ & + \gamma_5 \textit{Special Items}_q \times \textit{POST} \\ & + \gamma_6 \textit{Other Exclusions}_q \times \textit{POST} \\ & + \gamma_7 \textit{Sales Growth} + \gamma_8 \textit{Log(Total Assets)} \\ & + \gamma_9 \textit{Earnings Volatility} + \gamma_{10} \textit{Loss} \\ & + \gamma_{11} \textit{Book-to-Market Assets} \\ & + \gamma_{12} \textit{Log(Age)} + \upsilon_{q+1,\,q+4}. \end{aligned} \tag{3}$$

Again we estimate least squares regressions, allowing errors to cluster by CUSIP, and include time and industry fixed effects. Results are presented in Table 7, Panel A. Referring first to the main effects, consistent with Doyle et al. (2003), the low-quality exclusions appear to be concentrated in other exclusions. Unlike in Doyle et al. (2003), however, in the earlier time period special items have positive and significant future earnings implications, consistent with Burgstahler et al. (2002); this difference is driven by our choice of control variables. We present regression results using the Doyle et al. (2003) control variables in Table 7, Panel B, and discuss these results below.

Turning to our interaction terms, there is evidence that other exclusions are more transitory following SEC intervention; γ_6 is positive and significant in all three samples. For example, in the full sample, the estimated coefficient on other exclusions is -1.73 in the earlier time period but only -1.07 ($-1.73 + 0.66$) in the later time period. Therefore, there is strong evidence of an increase in the quality of the other exclusions component of total exclusions following SEC intervention, and this finding holds in each of our samples.

Alternatively, we find that special items have become of lower quality over time. In particular, the estimated coefficient on special items interacted with *POST* is negative and significant in all three samples. For the full sample, the coefficient on special items is 0.56 in the earlier time period and 0.27 ($0.56 - 0.29$) in the later time period, consistent with more recurring items being included in special items in the later time period, reducing the positive impact of special items on future earnings.

Turning to Table 7, Panel B, we present regression results using the control variables from Doyle et al. (2003). The interaction term *Other Exclusions* × *POST* continues to support the notion that other exclusions have become more transitory, while the interaction term *Special Items* × *POST* continues to be negative and significant, suggesting special items have become of lower quality. The net effect for special items in the post-period is now negative ($0.03 - 0.23 = -0.20$), consistent with special items becoming less transitory.

Jointly, these tables provide strong evidence that while SEC scrutiny appears to have improved the quality of other exclusions, there may have been an unintended consequence for the quality of special items. While excluding "other" expenses from non-GAAP earnings in the period prior to SEC intervention was both relatively inexpensive and easily concealed through a lack of disclosure, our results suggest that managers have adapted to an alternate reporting strategy in the post-SEC intervention period by shifting more recurring items into special items. This finding is consistent with Entwistle et al. (2006), who report that the frequency of special item exclusions from non-GAAP earnings increased dramatically from 2001–2003 for S&P 500 firms. While special items are included in SEC

TABLE 7
Model of Future Operating Income on Special Items and Other Exclusions

Dependent Variable: Future Operating Income

Independent Variables	Predicted Sign	Full Sample	Non-Zero Exclusions	Constant Sample
		Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)
Panel A: Using Original Control Variables				
Intercept		−0.01	−0.00	0.03
		(−1.57)	(−0.05)	(2.04)
Non-GAAP Earnings	+	2.44	2.35	2.56
		(73.13)	(41.90)	(34.39)
Special Items	?	0.56	0.53	0.25
		(8.42)	(7.79)	(3.80)
Other Exclusions	−	−1.73	−1.74	−1.13
		(−14.60)	(−15.07)	(−5.85)
POST		0.01	0.01	−0.00
		(5.68)	(2.40)	(−0.06)
Special Items × *POST*	?	−0.29	−0.31	−0.21
		(−3.41)	(−3.59)	(−2.38)
Other Exclusions × *POST*	+	0.66	0.62	0.41
		(4.52)	(4.24)	(2.06)
Sales Growth		−0.00	−0.02	0.01
		(−0.55)	(−1.45)	(1.28)
Log (Total Assets)		0.00	0.00	−0.00
		(8.70)	(3.57)	(−1.19)
Earnings Volatility		−0.22	−0.18	−0.23
		(−11.96)	(−7.44)	(−6.37)
Loss		−0.03	−0.02	−0.01
		(−16.23)	(−11.56)	(−4.29)
Book-to-Market Assets		−0.01	−0.01	−0.02
		(−2.19)	(−3.70)	(−5.77)
Log (Age)		0.01	0.01	0.00
		(9.90)	(7.42)	(5.24)
Time Fixed Effects		Included	Included	Included
Industry Fixed Effects		Included	Included	Included
R^2		63.85%	56.90%	62.93%
Number of Firm-Quarters		104,954	30,955	52,553
Number of Firms		7,904	6,135	2,126
Panel B: Using Control Variables from Doyle et al. (2003)				
Intercept		0.00	0.01	0.02
		(0.33)	(0.48)	(2.08)
Non-GAAP Earnings	+	2.84	2.71	2.77
		(106.23)	(58.84)	(47.33)
Special Items	?	0.03	0.04	−0.04
		(0.41)	(0.52)	(−0.59)

(*continued on next page*)

TABLE 7 (continued)

Dependent Variable: Future Operating Income

Independent Variables	Predicted Sign	Full Sample Coefficient (t-statistic)	Non-Zero Exclusions Coefficient (t-statistic)	Constant Sample Coefficient (t-statistic)
Other Exclusions	−	−2.28 (−19.03)	−2.25 (−19.22)	−1.41 (−7.03)
POST		0.01 (6.78)	0.01 (3.47)	0.00 (0.84)
Special Items × *POST*	?	−0.23 (−2.67)	−0.26 (−2.99)	−0.22 (−2.44)
Other Exclusions × *POST*	+	0.58 (3.86)	0.55 (3.69)	0.34 (1.64)
Sales Growth		0.02 (1.79)	−0.00 (−0.31)	0.03 (3.01)
Accruals		−0.35 (−20.78)	−0.34 (−13.69)	−0.19 (−9.06)
Time Fixed Effects		Included	Included	Included
Industry Fixed Effects		Included	Included	Included
R^2		64.04%	56.98%	63.376%
Number of Firm-Quarters		90,129	27,430	46,057
Number of Firms		6,758	5,267	1,875

POST = indicator variable that is equal to 1 if the firm-quarter observation occurs between 2001 Q3 and 2004 Q3 (inclusive), and 0 if the firm-quarter observation occurs between 1998 Q2 and 2001 Q2 (inclusive).

Each regression includes time fixed effects and industry fixed effects defined over the Fama-French 48 industry classification. The errors are allowed to cluster by CUSIP.

Accruals = calculated as the difference between net income before extraordinary items per share and cash from operations per share, and is scaled by assets per basic share outstanding (#44/#15).

See Table 1 for additional information.

filings that are audited or reviewed, the recurring items can be concealed in charges such as "restructuring" or "Y2K expenses" both before and after SEC intervention.

Thus far, we are not able to determine whether our result on special items is due to firms "switching" from reporting low-quality other exclusions in the pre-intervention period to low-quality special item exclusions in the post-intervention period, or due to firms independently initiating a strategy of including more recurring items in special items in the post-intervention period. This is an important distinction, as the former scenario is more consistent with SEC intervention driving the change, while the latter could be attributed to economic events. We therefore examine whether the decline of other exclusions usage across the two periods is linked with the decrease in the quality of special items in the latter period. We find that in the post-SEC scrutiny period, special items are of the lowest quality for firms that had reduced their reporting of other exclusions since the SEC scrutiny (results not tabulated). This evidence is consistent with managers adapting their earnings management mechanisms in response to the SEC actions.

Robustness Checks

Sensitivity to the Cutoff between Pre- and Post-Scrutiny

Our main analysis uses the second quarter of 2001 as the final quarter of the pre-intervention period because the SEC actively and publicly scrutinized non-GAAP reporting beginning in mid-2001. However, SOX was not approved until August 2002, and Reg G did not become effective until March 2003. In this section, we investigate whether our results are sensitive to the cutoff used. We consider three alternative cutoffs for H1. For the first two alternative cutoffs, we roll our sample back one quarter and forward one quarter. Results (not tabulated) are not sensitive to these changes to the cutoff period. We also consider only eight quarters from each period and exclude 2001 and 2002 entirely; again results are not sensitive to this alternative specification. As such, our conclusions are not dependent on the cutoff we use for SEC intervention.

Alternative Dependent Variable

We replicate our results using future GAAP earnings (data item #19 summed over $q+1$ to $q+4$) as an alternative dependent variable (not tabulated). In our test of H1 (corresponding to Table 4), the main effect of total exclusions is larger in magnitude than in Table 4 (-0.99 versus -0.55), consistent with special items exhibiting autocorrelation. This result may be due to economic events (such as a multiple-year restructuring charge), which supports our choice of using operating earnings as our main dependent variable. However, the results are very similar overall using this alternative dependent variable.

The Effects of Accounting Changes—SFAS No. 142 and SFAS No. 123R

There have been several changes to accounting standards in our sample period. The two most relevant to our study are SFAS No. 142 and SFAS No. 123R. SFAS No. 142, effective for fiscal years beginning after December 15, 2001, eliminates the amortization of goodwill and requires managers to recognize impairment losses if the assessed value of goodwill falls below the book value of goodwill. This change has important implications for our study. Prior to 2002, goodwill amortization was a possible exclusion from non-GAAP earnings (see Bhattacharya et al. 2004). Because goodwill amortization is a recurring item, it would constitute a "poor-quality" exclusion using our methodology.[23] However, goodwill impairments tend to be one-time events and thus would be "high-quality" exclusions. While initial goodwill impairments in fiscal 2002 were recorded as a change in accounting principles and therefore do not fall into our definition of exclusions, we explicitly examine the potential impact of SFAS No. 142 as a robustness check.[24] We consider two alternate specifications: we eliminate firm-quarters with goodwill impairments and eliminate firm-quarters with non-zero goodwill on the balance sheet. Our results are consistent under these alternative specifications.

SFAS No. 123R, effective for fiscal years beginning after June 15, 2005, requires the expensing of employee stock options. While this effective date falls after the end of our sample period, some firms began voluntarily expensing employee stock options during our sample period. Descriptive evidence by Entwistle et al. (2006) shows that exclusions of stock compensation expenses from non-GAAP earnings reported in the press releases of S&P 500 firms remained roughly constant over 2001–2003, which would suggest that would be no change in the quality of total exclusions over the pre- and post-SEC intervention periods due to voluntary expensing of stock compensation.

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[23] Interestingly, the exclusion of goodwill is not systematic among the same firms. Bhattacharya et al. (2004) find that the same firm will sometimes exclude goodwill amortization and at other times not exclude it, highlighting the subjectivity of non-GAAP exclusions.

[24] Entwistle et al. (2006) report that the frequency of accounting change exclusions increased substantially over 2001–2003 for S&P 500 firms. However, because we use the Compustat definition of earnings before extraordinary items, which excludes the cumulative effects of accounting changes, as our measure of GAAP earnings, accounting changes are excluded from our analyses.

I/B/E/S analysts, however, diverge in their treatment of stock compensation expenses: some exclude them from their forecasts and actual earnings, while others include the expenses. I/B/E/S responds by going with the majority for each firm, though they commented that the trend is to include these expenses in earnings. If I/B/E/S analysts exclude these expenses from core earnings, we would expect to see a *decrease* in the quality of total exclusions; we find the opposite for total exclusions. While we do present evidence that special items have decreased in quality, stock option expenses fall into "other exclusions" rather than into special items.[25] Thus, to the extent that analysts exclude these expenses from core earnings, this will weaken the strength of our tests.

Alternative Event Date

We are interested in changes to non-GAAP reporting in response to SEC intervention, not the natural evolution of non-GAAP reporting. As such, it is important to verify that our results are unique to the SEC intervention period. We replicate H1 for the 26 quarters directly preceding our test period, Q4 1991–Q1 1998 (results not tabulated). In support of SEC intervention causing the changes to exclusion quality in our main analysis, we find no improvement in the quality of exclusions over this alternative time period for any of our three samples (which were re-created for the alternative time period). We also find no evidence that the firms that stopped issuing non-GAAP earnings had lower quality exclusions prior to stopping and find no significant changes in the components of total exclusions (special items and other) around our alternative event date.

V. CONCLUSION

We examine empirically the effects of intensified scrutiny over non-GAAP reporting on the quality of non-GAAP earnings exclusions. We find that, on average, exclusions are of higher quality following intervention by the Securities and Exchange Commission (SEC) into non-GAAP reporting. We further find that firms that stopped releasing non-GAAP earnings numbers after the SEC intervention had lower quality exclusions in the pre-intervention period. These results are consistent with the SEC's objectives of improving the quality of non-GAAP earnings figures. However, when we decompose total exclusions into special items and other exclusions, we find evidence that the quality of special items has decreased in the post-intervention period, which suggests that managers adapted to the new disclosure environment by shifting recurring expenses into special items. This suggests that there may be unintended consequences arising from the heightened scrutiny over non-GAAP reporting.

There are limitations to the study. Because we rely on I/B/E/S as our data source for non-GAAP earnings, it is possible that our results are attributable to changes in analyst behavior rather than manager behavior. We believe this is unlikely for several reasons. First, the regulatory actions taken by the SEC were directed at firms, not analysts, and managers therefore have greater incentives than do analysts to change their non-GAAP reporting practices. Second, Gu and Chen (2004) show that analysts begin with the press release figure and re-insert the most permanent expenses to core earnings. As a result, there tends to be a relatively high degree of correspondence between press release and analyst figures. Last, prior research using press release data (Marques 2006) has already documented a decrease in the frequency of non-GAAP reporting that cannot be attributed to analyst behavior, which gives us greater confidence that managerial behavior is the primary driver. However, we acknowledge the possibility that the reconciliation of non-GAAP earnings with the most directly comparable GAAP figure may improve analysts' ability to define core earnings in the post SEC intervention period. While this possibility cannot explain our result showing that the quality of special items has declined in the post intervention period, it is consistent with our result for "other exclusions." This caveat should be kept in mind when interpreting the overall results.

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[25] Stock option expenses are included in selling, general, and administrative expenses.

A second limitation is our reliance on Compustat-defined special items. As noted in the paper, our interest is examining managerial behavior regarding special items versus other exclusions, yet our measure of special items is not defined by managers but by a database provider. We therefore necessarily assume a high degree of correspondence between managers' and Compustat's designation of special items. We believe this is a reasonable assumption since Compustat includes in its Special Items measure any item called "special" or "nonrecurring" by the firm, regardless of how frequently it is reported on firms' income statements. More importantly, we do not believe that our use of Compustat-defined special items biases our results in any particular direction. In addition, to rule out the possibility that a change in Compustat's definition of special items could explain our results, we contacted S&P directly and were assured that no such change occurred. However, to the extent that this information is incorrect, it may affect the accuracy of our inferences.

An additional limitation is that all of our tests and inferences are based on a single construct—the correlation of non-GAAP exclusions with future operating income. We acknowledge that there are numerous other ways of assessing the effectiveness of SEC intervention. Indeed, Marques (2006), who examines the change in frequency of non-GAAP reporting, and Heflin and Hsu (2005), who examine changes in the likelihood that non-GAAP numbers exceed earnings benchmarks, have already employed two of these alternative techniques. Other possibilities include examining changes in manager emphasis and presentation of non-GAAP numbers in press releases, as in Bowen et al. (2005), or dealing with the issue experimentally, as in Elliott (2006) or Frederickson and Miller (2004). Our approach is but one way to address this important question.

Last, we also acknowledge that a major part of the SEC intervention into non-GAAP reporting—Regulation G—was concurrent with other new requirements mandated by SOX, such as the certification of financial statements, restrictions on the composition of the board of directors and audit committees, and internal control disclosure requirements. It is possible that it is not the SEC actions related to non-GAAP reporting that brought about the changes in exclusion quality that we document, but rather some other unforeseen consequence related to SOX at large. *Ex ante*, however, it is not obvious how other effects associated with SOX might impact non-GAAP reporting, though we acknowledge this possibility.

The paper contributes to several streams of literature, including the literatures on non-GAAP reporting, disclosure regulation, and the effects of Sarbanes-Oxley. Given our results showing that managers adapt to the new disclosure environment by shifting recurring expenses into special items, future research might address whether managers also adjust their disclosure strategies in other ways.

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Executive Stock Options, Missed Earnings Targets, and Earnings Management

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ABSTRACT: This paper examines whether stock-option grants explain missed earnings targets, including reported losses, earnings declines, and missed analysts' forecasts. Anecdotal evidence and surveys suggest that managers believe that missing an earnings target can cause stock-price drops (Graham et al. 2006). Empirical studies corroborate this notion (Skinner and Sloan 2002; Lopez and Rees 2002). Thus, a missed target could benefit an executive via lower strike price on subsequent option grants. Prior option grant studies explore only general downward earnings management (Balsam et al. 2003; Baker et al. 2003), but our study is the first to explore whether option grants encourage missed earnings targets. Indeed, if missed targets drive the prior results, then the literature has failed to document an important negative outcome of stock-option incentives. We use quarterly and annual data for fixed-date options granted after firms announce they have missed earnings targets. We find that firms that miss earnings targets have larger and more valuable subsequent grants. Further, we find that the likelihood of missing earnings targets for firms that manage earnings downward increases with stock-option grants. To control for the possibility that firms miss earnings targets for operational reasons, we only include firms that likely managed earnings downward (Dechow et al. 1995; Phillips et al. 2003). Backdating or opportunistic timing of grants cannot explain our results because we include only fixed-date grants. While many studies explicitly consider whether and why managers meet or beat earnings targets, ours is the first study to find that some managers may seek to miss earnings targets (Burgstahler and Dichev 1997).

JEL Classification: *G34; J33; M41; M52.*

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Data Availability: *All data used in this study are publicly available.*

I. INTRODUCTION

This paper examines whether stock-option grants explain some firms' missed earnings targets, including reported losses, earnings declines, and missed analysts' forecasts. Considerable research explores the "meet or beat" phenomenon because it is intuitive that managers would seek to increase earnings (e.g., bonuses, stock price, and labor-market reputation, among other incentives, increase with earnings). Less intuitive is why managers would seek to miss targets and, to our knowledge, we are the first to examine whether and why managers might do so. We posit that option grants create a strong incentive for executives to deliberately miss earnings targets. This represents an important incremental contribution to the collective understanding of earnings management and managerial incentives.

Recent surveys report that managers believe that missing an earnings target can cause stock prices to slide sharply (Graham et al. 2006). Anecdotal evidence supports managers' beliefs. For example, Google lost 7 percent of its market cap when it missed its 2005 fourth-quarter earnings target (Associated Press 2006), and eBay lost 20 percent when it missed its earnings target by 1 cent (Defner 2005). Empirically, missed targets precipitate significant negative price reactions (Skinner and Sloan 2002; Lopez and Rees 2002), thereby decreasing the strike price of subsequent at-the-money option grants. Thus, while missed earnings targets may be costly to shareholders, including executives who hold stock, a missed target could directly benefit managers who anticipate large stock-option grants. We explore whether managers who expect large subsequent stock-option grants (i.e., options granted after earnings are announced) miss earnings targets via downward earnings management.

Executive stock options traditionally have been used to align managerial interests with those of shareholders when separation of ownership and control causes agency problems (Jensen and Meckling 1976). However, when decisions are personally costly to the managers such that they bear a disproportionate amount of the costs relative to the benefits (e.g., firing employees) or when decisions disproportionately benefit managers relative to shareholders (e.g., perquisites such as corporate jets), managers may respond in ways contrary to shareholders' interests (Jensen 2005). Prior studies find that managers opportunistically time news and/or manage earnings to increase the value of stock-option grants. For example, Chauvin and Shenoy (2001) and Aboody and Kasznik (2000) document negative abnormal stock price changes just prior to stock-option grants and attribute the stock price declines to CEOs' opportunistic timing of bad news. Similarly, Cheng and Lo (2006) find that firms increase bad news forecasts before executive share purchases. In these studies, bad news is exogenous and managers choose when to report the news. In our study, bad news is endogenous; executives manage earnings downward, report a missed earnings target, and thereby create the bad news. This difference (bad news being exogenous versus endogenous) makes our study unique among stock-option studies.

Most of the earnings management studies that explore stock-option incentives consider upward earnings management and find that managers increase earnings to increase the value of employee stock options and option exercises (e.g., Jensen et al. 2004; Bartov and Mohanram 2004; Bergstresser and Philippon 2006; Burns and Kedia 2006; Efendi et al. 2007). These studies document general upward earnings management but not management around specific targets. To extend the literature, Cheng and Warfield (2005) investigate specific targets and find that managers manipulate earnings upward to meet or beat earnings targets before stock-option exercises. The findings in Cheng and Warfield (2005) complement the general upward earnings management studies by examining a specific subset of firms that increase earnings to meet targets.

With respect to downward earnings management, two studies find that managers decrease earnings to increase the value of stock-option grants (Balsam et al. 2003; Baker et al. 2003). Neither study considers the subset of firms that miss earnings targets. Indeed, if miss firms drive the results of these two studies, the authors do not document or isolate an important negative outcome of stock-option incentives. We extend Balsam et al. (2003) and Baker et al. (2003) by specifically studying firms that miss earnings targets.

The distinction between general earnings management and missed earnings targets is important because missed targets hold special psychological and economic importance. Indeed, numerous prior studies document abnormal managerial behavior surrounding earnings thresholds (Burgstahler and Dichev 1997; Dhaliwal et al. 2004; Cheng and Warfield 2005; Jacob and Jorgensen 2007). In particular, Degeorge et al. (1999) argue that managers' behavior is strongly influenced by investors, directors, customers, and suppliers, all of whom can more easily detect a missed earnings target than general earnings management. The stock price reaction is likely to be greater in the case in which downward earnings management leads to a missed earnings target than in the case in which no missed target occurs (Skinner and Sloan 2002). Hence, managers who expect large stock-option grants would benefit most from income-decreasing accruals that precipitate a missed target. Whether managers engage in such behavior is the empirical question we address.

We gather ExecuComp and Compustat data for 1,724 firms for 1992 through 2005 and test for an association between missed earnings targets and option grants. *A priori*, such an association might be positive as we expect, or negative (e.g., the board reduces options to punish poor performance). Thus, we begin by establishing the direction of any association. We find that firms are more likely to miss quarterly earnings targets immediately before option grants. Moreover, grants that follow the announcement of a missed quarterly earnings target are larger in dollar terms and relative to other executive compensation.

We extend this analysis with annual data in a multivariate model that controls for conflicting incentives created by cash bonus, option exercises, stock and option holdings, as well as firm-level attributes such as debt-default, growth, and mergers and acquisitions (Fields et al. 2001). We find that managers with larger subsequent grants are more likely to miss annual earnings targets even after controlling for conflicting incentives and other factors that potentially influence the decision to avoid missing an earnings target. These results are robust across models where missed earnings target is a loss, an earnings decline, or a missed analyst forecast.

We believe that the positive relation between missed earnings targets and grants suggests a chain of events from anticipated larger option grants to earnings management to missed earnings targets. There could, however, be alternative explanations for our findings. One possibility is that boards opportunistically time option grants (Yermack 1997) or backdate grants to coincide with stock price declines (Heron and Lie 2007). In-depth investigations by the SEC and New York's District Attorney corroborate these academic findings.[1] Given this evidence, one might suspect that opportunistic timing or backdating, and not earnings management, explain the relation between missed earnings targets and option grants. To mitigate the possibility that our results are attributable solely to timing and backdating, we retain only fixed-date grants. By definition, grants that are awarded at the same time each year (fixed-date grants) cannot be opportunistically timed or backdated. We continue to find an increased likelihood of firms' missing earnings targets before large fixed-date grants. We use this reduced sample for the remainder of our tests.

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[1] The *Wall Street Journal* maintains an online record of details of such investigations at: http://online.wsj.com/public/resources/documents/info-optionsscore06-full.html.

Another alternative explanation is that the direction of the causality is reversed. That is, instead of large, anticipated stock-option grants driving executives to manage earnings and miss earnings targets (hereafter, we call this "the earnings management story"), it is possible that the compensation committee grants executives larger options following a missed earnings target to encourage greater effort from the executive and better future firm performance (hereafter, we call this "the encouragement story"). To disentangle the two stories, we identify and retain only those firms that missed earnings targets and are likely to have managed earnings downward. This research design excludes firms that missed an earnings target for operational reasons. We use two common earnings management measures (abnormal accruals and deferred tax expense) to identify firms likely to have managed earnings downward (Dechow et al. 1995; Phillips et al. 2003). Consistent with the earnings-management story, we find that managers who anticipate large fixed-date stock-option grants are more likely to miss important earnings targets by reducing earnings.

Some might argue that deliberately missing an earnings target is irrational. However, irrationality implies that executives do not appropriately weigh the expected costs of their decisions. We maintain that the choice to miss a target is based on executives' rational, *ex ante* cost-benefit trade-off, which we model by including both the benefits (as measured by subsequent fixed-date option grants) and the costs (control variables including executive compensation and firm incentives). Our results are consistent with this sort of cost-benefit trade-off: managers who expect a large bonus or who foresee large stock-option exercises are less likely to miss earnings targets.

Our study responds to Dechow and Skinner (2000), who encourage academics to focus earnings management research on capital market incentives, arguing that managers have become increasingly sensitive to stock prices and price reactions to key accounting numbers such as earnings. We provide new evidence that stock-option grants create incentives for executives to miss important earnings targets. While many prior studies document that firms strive to meet or beat earnings targets (Burgstahler and Dichev 1997; Dhaliwal et al. 2004; Cheng and Warfield 2005), we are aware of no study that considers whether and why firms miss earnings targets. Thus, analogous to Cheng and Warfield (2005), our study complements general downward earnings management studies by examining specific incentives that induce managers to depress earnings to miss important earnings targets. This is important because earnings management that leads to missed targets is potentially more costly to shareholders than earnings management at other unspecified points along the earnings distribution (Skinner and Sloan 2002).

Our study may also be of interest to academic researchers who study earnings management. Burgstahler and Dichev's (1997) now-famous graph of the cross-sectional earnings distribution, shows a trough in the distribution just to the left of zero and a spike just to the right. From this, Burgstahler and Dichev (along with the many meet/beat papers that followed) conclude that firms try to avoid falling into the trough. In contrast, our results suggest that some firms may deliberately try to fall into the trough. Consequently, the Burgstahler and Dichev (1997) graph for firms with larger stock-option grants will have a shallower trough. This is somewhat counterintuitive as it is commonly assumed that stock options create incentives for upward earnings management, which would deepen the trough and augment the spike. Importantly, neither prior downward earnings management study

(Balsam et al. 2003; Baker et al. 2003) documents this change in the depth of the trough—both show only a leftward shift of the earnings distribution, but no change in its shape.

The paper proceeds as follows. In Section II we develop our hypotheses. Section III describes our sample and the research design. Section IV reports our results, and Section V concludes.

II. HYPOTHESIS DEVELOPMENT

Theoretically, executive stock options align managers' and shareholders' interests (Jensen and Meckling 1976). The goal of options is to induce greater future effort from the manager (for an excellent discussion of the incentive properties of stock based compensation, see Cheng and Warfield [2005]). Prior research finds that options are positively related to firm performance one and two years after the grant date (Murphy 1985). Because grants are related to future, but not past, firm performance, in theory, there should be no systematic relation between subsequent option grants for firms that report poor performance as compared to firms that report good performance. However, subsequent option grants could be positively associated with poor earnings reports if the board increases stock-based compensation to increase the executive's pay-for-performance sensitivity (Core and Guay 1999). Alternatively, boards of directors that observe a poor earnings report (e.g., a missed earnings target or a big bath), could reduce or eliminate subsequent grants to punish the CEO. In that event, we would observe a negative relation between missed targets and grants. Accordingly, we examine the following hypothesis:

H1: Executive stock-option grants are unrelated to missed earnings targets.

Hypothesis 1 does not consider that managers might behave strategically because stock options may engender manager-shareholder conflicts (Jensen 2005) that might encourage earnings management (e.g., Jensen et al. 2004; Burns and Kedia 2006; Efendi et al. 2007). That is, a positive association between grants and missed targets is consistent with boards increasing grants to encourage better future performance (missed targets lead to larger grants). But a positive association is also consistent with the notion that managers who face strong and deterministic option-grant incentives may take *ex ante* actions to miss earnings targets (larger grants lead to missed targets). Hypothesis 2 considers these strategic implications of stock-based compensation.

Both conventional wisdom and prior empirical results suggest that options provide incentives to manage earnings. Grants encourage downward earnings management, whereas exercises provide incentives to manage earnings upward (e.g., Balsam et al. 2003; Baker et al. 2003; Bartov and Mohanram 2004; Bergstresser and Philippon 2006; Kadan and Yang 2006). Although prior research documents an association between downward earnings management and option grants (Balsam et al. 2003; Baker et al. 2003), this research does not consider the potentially more interesting, and economically significant situation where the CEO manages earnings downward, or fails to manage them upward, thereby missing an important earnings target. More on point is evidence from Cheng and Warfield (2005) who document that stock-option exercises and holdings provide incentives for firms to meet or beat earnings targets. But no prior research explores whether and why firms miss earnings targets.

Graham et al. (2006) report that managers believe missing an earnings target reduces stock price. Indeed, empirical evidence ascertains that missed earnings targets can be particularly costly to shareholders (Skinner and Sloan 2002) and that investors' response to firms' missing (large negative response) or meeting earnings targets (moderate positive response) is asymmetric (Lopez and Rees 2002). Therefore, missed earnings targets can reward a CEO with option grants that are pegged to a lower stock price.

Arguably, option grants may provide significant but not sufficient incentives to induce managers to miss targets. A manager who regularly misses targets (loses money, decreases earnings, misses analysts' numbers) could get fired rather than receive options (Fama 1980). Missing earnings targets can also adversely affect the CEO's other compensation (e.g., bonuses) or the CEO's total wealth (e.g., unexercised stock options and stock held) or the firm's prospects (e.g., by provoking default on debt covenants and also by affecting firms' growth). Thus, intentionally missing an earnings target is a risky strategy.[2] Consequently, it is an empirical question as to whether executives who anticipate large grants will manage earnings downward and miss earnings targets. We hypothesize:

H2: Large fixed-date stock-option grants increase the likelihood that CEOs manage earnings downward and miss earnings targets.

III. SAMPLE SELECTION, RESEARCH DESIGN, AND VARIABLE MEASUREMENT

Sample

We are interested in testing whether firms manage earnings downward and miss earnings targets to increase the value of subsequent stock-option grants. We use two distinct samples: one with quarterly data and one with annual data. The quarterly data provide rich descriptive evidence and allow us to establish temporal precedence and contiguity more precisely than with annual data (Shadish et al. 2001). We use annual data in multivariate tests because quarterly data limitations prevent us from fully testing our hypotheses.[3] Both samples include firms in the intersection of the CRSP, Compustat, and ExecuComp databases from 1992 to 2005. We describe each dataset below.

Our quarterly dataset includes all quarterly observations for the 1,633 firms that ever granted fixed-date options from 1992 to 2005. This yields 61,972 firm-quarter observations. We eliminate 7,038 observations due to missing data required to determine whether firms missed an earnings target. We impose no further screens on the quarterly data in order to provide broad descriptive evidence. Our final sample includes 54,934 firm-quarter observations. This sample selection allows each firm to serve as its own control in quarters in which it does (does not) miss an earnings target. Table 1, Panel A summarizes the sample derivation for the quarterly dataset.

To obtain our annual dataset, we begin by gathering compensation variables for all firms in ExecuComp from 1992 through 2005, which yields 21,414 firm-years (2,704 firms). We exclude 4,371 utility and financial service firm-years because operations of these firms are significantly different from other industrial firms. We exclude 6,205 firm-years with no CEO option grants. We gather financial accounting data from Compustat and exclude 597 firm-years with missing data such as missing lead and lag values required to calculate change variables and to distinguish fixed-date grants. Our last filter arises from the research design requirement that option grant dates follow the annual earnings announcement. We gather annual earnings announcement dates from Compustat. ExecuComp reports specific

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[2] Managers' actions to decrease stock price by missing earnings target before stock-option grants will fail if investors can see through this strategic behavior. However, it is difficult for investors to detect the behavior given a few firm-specific observations. Moreover, if a firm routinely misses targets before stock-option grants and investors observe this, the CEO is likely to be punished, which we will discover when we test H1.

[3] We more completely describe the limitations of quarterly data later when we discuss our tests of the hypotheses.

TABLE 1
Sample Selection and Descriptive Statistics for Quarterly Data

Panel A: Sample Selection for Just-Miss Firms—Quarterly Data

Total firms in ExecuComp that ever granted fixed-date options	1,633
Total quarterly observations in Compustat for 1,633 firms, above, with available earnings and asset data	54,934
Total quarterly observations for firms that just miss zero earnings target	1,723
Percent of quarterly observations that just miss earnings target	3.14%

Panel B: Sample Selection—Annual Data

	Distinct Firms	Firm Years
Total ExecuComp observations for fiscal years 1992–2005, with intersection in Compustat	2,703	21,401
Less: Observations in utilities and financial-services industries	−592	−4,371
Less: Observations with no option grants	−249	−6,205
Less: Observations with missing data items	−33	−597
Less: Observations with grants before earnings announcement date	−105	−2,312
Base sample	1,724	7,916
Sample for tests involving *Miss_Zero*		
Base sample	1,724	7,916
Less: Observations with moderate loss	−172	−1,532
Sample size (n)	1,552	6,384
Observations where *Miss_Zero* = 1		622
Sample for tests involving *Miss_PriorYr*		
Base sample	1,724	7,916
Less: Observations with moderate earnings decline	−176	−1,974
Sample size (n)	1,548	5,942
Observations where *Miss_PriorYr* = 1		1,495
Sample for tests involving *Miss_Analysts*		
Base sample	1,724	7,916
Less: Observations with missing I/B/E/S/CRSP data and observations that miss analyst forecast by moderate amount	−422	−4,063
Sample size (n)	1,302	3,853
Observations where *Miss_Analysts* = 1		1,502

Panel C: Distribution of Firms by Year (annual sample)

Year	Distinct Firms	Percent of Sample
1992	155	2
1993	440	6
1994	580	7
1995	661	8
1996	660	8
1997	692	9
1998	709	9

(*continued on next page*)

TABLE 1 (continued)

Year	Distinct Firms	Percent of Sample
1999	707	9
2000	712	9
2001	691	9
2002	688	8
2003	693	9
2004	528	7
Total firm-years	7,916	100

Panel D: Industry Distribution (annual sample)

	Fama-French Industry Classification	Number of Observations	Percent of Sample
1	Food Products	41	3
2	Beer and Liquor	7	0
3	Tobacco Products	1	0
4	Recreation	39	2
5	Printing and Publishing	32	2
6	Consumer Goods	40	2
7	Apparel	14	1
8	Healthcare, Medical Equipment	130	8
9	Chemicals	56	3
10	Textiles	6	0
11	Construction and Construction	58	4
12	Steel Work, etc.	45	3
13	Fabricated Products and Machinery	71	4
14	Electrical Equipment	13	1
15	Automobiles and Trucks	49	3
16	Aircraft, Ships, and Railroad	16	1
17	Precious Metals, Non-Metallic	20	1
19	Petroleum and Natural Gas	88	5
21	Communication	54	3
22	Personal and Business Services	105	6
23	Business Equipment	401	23
24	Business Supplies and Shipping	20	1
25	Transportation	27	2
26	Wholesale	67	4
27	Retail	110	6
28	Restaurants, Hotels, Motels	5	0
	Others	209	12
		1,724	100

option expiration dates, which permits us to estimate grant dates and determine whether such dates follow earnings announcements. This filter excludes 2,312 firm-years with CEO option grant-dates before the earnings-announcement dates. These procedures leave us with an annual sample of 7,916 firm-years (1,724 firms). See Table 1, Panel B.

Table 1, Panel C, provides a year-by-year breakdown of our observations and shows a uniform distribution across the sample period. Table 1, Panel D reveals some industry clustering—Business Equipment accounts for about a fifth of the observations. This is not surprising because this category comprises numerous SIC codes, including industrial equipment (SIC 35) and Instrumentation (SIC 37) as well as computer manufacturers and other computer hardware firms that traditionally have been intensive stock-option users.

Variable Measurement

Defining Firms that Miss Earnings Targets

Both of our hypotheses consider missed earnings targets. Prior literature suggests that managers focus on meeting or beating three distinct earnings targets: positive earnings, last year's earnings (Burgstahler and Dichev 1997), and analysts' forecasts (Brown and Caylor 2005). Thus, we create three separate variables to indicate missed earnings targets. We perform all of our empirical tests on three separate subsamples, one for each of the three earnings targets, which we describe below.

Firms that Miss the Positive Earnings Target

First, we identify a set of firms that miss the zero earnings target. Conventional wisdom and extant research suggest that losses have the biggest impact on stock price when the oss is very small (i.e., the firm just misses reporting positive earnings) or when the loss is very large (i.e., the firm reports a "big bath"). Thus, we construct an indicator variable, *Miss_Zero* that identifies firms that just miss the positive earnings target or that report a big bath. We identify just-miss firms as those that report losses (Compustat Data172) of no more than 2 percent of lagged market value (Burgstahler and Dichev 1997). We identify big bath firms as those that report negative earnings scaled by lagged market value in the owest quartile for the firm's industry that year. That is, *Miss_Zero* is coded 1 when -2 percent $<$ [$\text{Earnings}_t/\text{Market Value}_{t-1}$] < 0 or when $\text{Earnings}_t < 0$ and [$\text{Earnings}_t/\text{Market Value}_{t-1}$] is in the lowest quartile (by industry and by year). *Miss_Zero* is coded 0 for firms hat report positive earnings. Our sample excludes 1,530 firm-years with moderate losses, resulting in a subsample of 6,384 firm-years (1,552 firms). See Table 1, Panel B.[4]

Firms that Miss Prior-Year Earnings Target

Second, we identify firms that miss the prior-year earnings target, i.e., report an earnings decline. Consistent with our methodology above, we define *Miss_PriorYr*, to indicate firms with very small or very large earnings declines. *Miss_PriorYr* equals 1 for firms with current-year earnings lower than prior year's earnings (both scaled by lagged market value) by no more than 1 percent (Burgstahler and Dichev 1997) and for firms whose year-on-year losses are in the lowest quartile, within the firm's industry that year. We code *Miss_PriorYr* as 0 when the firm meets or exceeds prior year's earnings. The earnings-decline subsample excludes 1,974 firm-years with moderate earnings decline, leaving a subsample of 5,942 firm-years (1,548 firms).

Firms that Miss Analysts' Forecasts

Third, we identify firms that miss analysts' forecasts either by a small amount or by a wide margin. *Miss_Analyst* is coded as 1 if: (1) the firm's EPS (Compustat Data57) minus the last analysts' median forecast before the earnings announcement (I/B/E/S MEDEST) is negative but no less than −0.5 percent of stock price (CRSP PRC), or if (2) the EPS missed the last analysts' forecast before the earnings announcement by more than 10 percent of stock price.[5] We code *Miss_Analyst* as 0 for firms that meet or beat analysts' forecasts, which means that we exclude observations that miss analysts' forecast by a moderate amount. As Table 1, Panel B shows, this subsample comprises 3,853 firm-years (1,302 firms), which is smaller than the other two subsamples because of the additional requirement of having available I/B/E/S and CRSP data. We lose 4,063 observations due to this stronger restriction.

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[4] Our main tests and models, including our multivariate regressions, use annual data and the *Miss_Zero* specification as defined here. To provide additional evidence, our quarterly data analysis and certain robustness tests separately investigate firms that miss the zero earnings target by a small amount (we label these as "just miss" observations). For these additional quarterly tests, we define just-miss firms as those where -0.5 percent $<$ [$\text{Earnings}_t/\text{Market Value}_{t-1}$] < 0.

Descriptive Results of Missed Earnings Targets

Table 1, Panel A reveals that about 3 percent of firms just miss reporting positive income on a quarterly basis, far fewer than expected if earnings were normally distributed, but consistent with the "trench" just below zero documented by Burgstahler and Dichev (1997).[6] Table 1, Panel B reports the number of firms that miss annual earnings targets for each of the three *Miss* specifications. Only 9.7 percent of firm-years (622/6,384) report slightly negative earnings or a big bath (*Miss_Zero* = 1), whereas nearly 40 percent of observations (1,502/3,853) miss an analysts' forecast (*Miss_Analyst* = 1).

Defining Option Grants and Fixed-Date Grants

Our test variable *Grants* is the reported Black-Scholes fair value of stock options granted to the CEO (ExecuComp BLK_VALU) after the annual earnings announcement each year.[7] We deflate *Grants* by CEO salary (ExecuComp SALARY) to capture the relative importance of the CEO grant activity. CEO salary provides a relatively stable deflator because salary is rarely reduced. As an alternative deflator we use total current compensation (ExecuComp TCC) and find similar results.

We use ExecuComp grant dates to identify "fixed-date" grants. We determine the option-grant date from the option's expiration date (ExecuComp EXDATE) and assume that option lives are denominated in whole years. We consider a grant to be a fixed-date grant if the grant date is within 14 days of the date on which options were granted in either of the previous two fiscal years, i.e., if two or more grants occur within 14 days over a three-year period.[8]

Consistent with prior studies, we use CEO-level compensation data to measure grants because CEOs have ultimate control over, and responsibility for, reported earnings (Yermack 1997; Aboody and Kasznik 2000; Burns and Kedia 2006; Cheng and Warfield 2005; Heron and Lie 2007; Efendi et al. 2007). Moreover, CEOs typically receive the lion's share of option grants.

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[5] Because we study firms' incentives to decrease share prices by managing *reported* EPS, we obtain EPS from Compustat rather than from I/B/E/S. This is consistent with recent papers (Jacob and Jorgensen 2007; Tucker and Zarowin 2006). For our main tests, we remove observations with nonzero special items (Compustat Data 17) but our results are robust to their inclusion. Our results also are unchanged if we control for special items instead of deleting observations.

[6] Burgstahler and Dichev (1997) report that 3.13 percent of firms in their sample "just miss" reporting positive earnings.

[7] The Black-Scholes model was not designed to value employee stock options and considerable theoretical and empirical evidence documents problems with doing so (Lambert et al. 1991; Rubinstein 1995; Cuny and Jorion 1995; Huddart and Lang 1996). Nonetheless, most firms use Black-Scholes fair values and we follow suit.

[8] This definition is consistent with Aboody and Kasznik (2000). Admittedly, we will misclassify grants to the extent that previous years' grants were also opportunistically timed.

Tests of Hypotheses

We begin with tests that use quarterly data; doing so enables us to establish temporal precedence and contiguity more precisely than with annual data (Shadish et al. 2001). We later use annual data in multivariate tests to fully test both hypotheses. The following sections describe our tests using quarterly and annual data, respectively.

Testing Hypothesis 1 with Quarterly Data

If H1 holds, then we would expect firms' missed earnings targets to be unassociated with subsequent stock-option grants. We employ univariate contingency tables to examine the frequency, number, and dollar value of options granted after missed earnings targets (e.g., Yermack 1997; Heron and Lie 2007; Forelle and Bandler 2006). We identify quarterly earnings announcement dates and determine whether the firm missed the earnings target (*Miss_Zero*). We obtain the value of options granted during the 90 days following each quarterly earnings announcement. To test H1, we determine whether the value of option grants following a missed quarterly earnings target is different from the value of grants that follow no misses. We also examine the incidence of *Miss_Zero* just before fixed-date grants. If the incidence is different from the time-series average incidence of *Miss_Zero*, we would conclude that missed targets are related to fixed-date option grants (reject H1).

Testing Hypothesis 1 with Annual Data

We use annual data to estimate a multivariate logistic regression of *Miss* on CEO *Grants*, other conflicting CEO incentives (Fields et al. 2001), and several firm-level factors that may explain the relation between missed targets and grants:

$$Miss_{it} = \beta_0 + \beta_1 Grants_{it+1} + \Sigma\, \beta_k CEO\_Incentive_{kit} + \Sigma\, \beta_s Control_{sit} + \varepsilon_{it}. \qquad (1)$$

We use annual data to estimate Equation (1) because quarterly data are limited in a number of ways. First, not all compensation data items are available quarterly (e.g., exercise dates, options held, restricted stock holdings, and number of shares owned are available only annually in ExecuComp).[9] Thus, our incentive controls are only available as annual data. Second, some quarterly compensation variables are less accurate than their annual counterparts because firms typically use annual rather than quarterly performance to calculate bonuses and other components of compensation (Jacob and Jorgensen 2007). Third, quarterly data engenders certain econometric problems. In particular, quarterly earnings and tax expense, which are inputs into our earnings-management measures, are not serially independent because firms often use their final fiscal quarter to meet annual earnings targets (Brown and Rozeff 1979; Dhaliwal et al. 2004; Jacob and Jorgensen 2007). Thus, while quarterly data help establish contiguity and temporal precedence, annual data address our hypotheses more completely.

We estimate three specifications of model 1, one for each of the *Miss* variables previously defined. An important element of our research design is that we include only options granted after the firms' annual earnings announcement because CEOs can only profit from a reduced strike prices if the firm's stock price has reacted to a missed target. Thus, by construction, option grants are measured in the year *after* the year in which we measure miss or no miss.

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[9] ExecuComp data come from firms' annual Def 14A (definitive proxy statement) SEC filings. Many other studies of the association between earnings management and executive compensation incentives use ExecuComp annual data, including Bartov and Mohanram (2004), Cheng and Warfield (2005), Burns and Kedia (2005), Erickson et al. (2005), and Efendi et al. (2007).

The model includes our research variable *Grants*, as previously defined. Equation (1) also includes other CEO compensation characteristics (*CEO_Incentive*) that potentially affect a CEO's decision to miss an earnings target. For example, prior research documents that CEOs have incentives to generally manage earnings upward (Bartov and Mohanram 2004; Bergstresser and Philippon 2005; Burns and Kedia 2006; Efendi et al. 2007) and to meet or beat earnings targets (Cheng and Warfield 2005) in conjunction with option exercises and holdings. Other research finds that in general, firms manage earnings upward to maximize CEOs' bonuses, but occasionally, manage earnings downward when managers miss their bonus by large amounts (Healy 1985). In either case, we expect a negative association between missed earnings targets and bonus because our definition of miss includes big baths. Thus, our model includes measures of these conflicting CEO compensation incentives. *Exercises* is the intrinsic value of options exercised by the CEO in the year *after* the year in which we measure miss or no miss. *Options* is the sum of the intrinsic values of the CEO's exercisable (vested) options and unexercisable (unvested) options and measures the potential stake the CEO will have in the firm's equity. We include *Bonus*, the CEO's annual bonus (Healy 1985; Mills and Newberry 2001) and *Stock*, the level of CEO stock ownership including restricted stock and stock owned outright (Nagar et al. 2003; Cheng and Lo 2006). We deflate *Exercises*, *Options*, *Bonus*, and *Stock* by CEO salary to capture the relative importance of each incentive.

Equation (1) also includes firm-level controls that may influence CEOs' incentives to meet earnings targets. We include a control for the elapsed time between the earnings announcement and the grant date because we expect that the relation between missed targets and option grants will be strongest when grants follow closely after the missed target is announced. Thus, we include *Gap_to_Grant* measured as the number of days between the earnings announcement date and option grant date. We expect a negative coefficient on this control variable. We also include *Leverage*, measured as long-term debt scaled by assets, to assess firms' proximity to debt default (DeFond and Jiambalvo 1994; Sweeney 1994). We include *Size*, the log of total assets to control for size and because growth affects investors' response to earnings performance, we include a control variable *Growth*, measured as the book-to-market ratio. Together, our size and growth variables also control for firms' life-cycle and proxy for external funds requirements and firms' incentives to avoid missing earnings targets. We include industry and year fixed-effects to control for industries or years with large stock-option grants or abnormal earnings distributions.

We will find reject H1 if β_1, the estimated coefficient on *Grants*, is non-zero. A negative β_1 is consistent with the notion that CEOs are punished for missing earnings targets. Conversely, a positive β_1 is consistent with (1) opportunistic timing of bad news, (2) opportunistic timing or backdating of options, (3) the encouragement story, or (4) the earnings management story. With respect to point (1) above, note that opportunistic timing of bad news cannot completely explain a positive association between missed targets and grants (Chauvin and Shenoy 2001; Aboody and Kasznik 2000) because we specifically examine missed earnings targets and not other general bad news events. Bad news may be related to the firm missing an earnings target (e.g., the news may explain why the firm missed its target). However, we would not attribute the missed earnings target directly to the bad news unless the news is released coincidental with the earnings announcement and also directly affects the earnings just announced. On the contrary, prior research suggests that firms use nonaccounting news disclosures as substitutes for negative earnings announcements and that conditional on type of news, the two modes of communicating bad news are negatively correlated (Gigler and Hemmer 2001; Givoly et al. 2007; Dietrich et al. 2007). Releasing bad news unrelated to prior-period earnings or before the earnings announcement might cause a negative stock price decline but we would not identify these firms as "misses."

To mitigate the possibility that our results are attributable solely to backdated option grants (point (2) above), we use only fixed-date grants and re-estimate Equation (1). By definition, if the option date is known, the manager cannot time the grant or backdate the options (Aboody and Kasznik 2000). In the next section, we discuss tests that distinguish between the encouragement and earnings management stories (points (3) and (4) above). Our research objective is not to rule out alternative hypotheses, which we maintain, could offer valid explanation for any positive association. Rather, our objective is to implicate earnings management as an additional explanation for this phenomenon.

Testing H2

Hypothesis 2 posits a chain of events from large, anticipated (fixed-date) option grants to earnings management to missed earnings targets to increased value of option grants. However, as noted above, a positive relation between missed targets and grants does not necessarily implicate earnings management because missed targets could be accidental or due to operational reasons, either of which could prompt the board to grant additional options to further encourage the CEO. Thus, to test H2 (and eliminate the encouragement story), we identify observations with missed earnings targets where downward earnings management seems likely (i.e., the missed target was not accidental). By only including firm-years with missed earnings targets that coincide with downward earnings management, we focus on earnings management as the explanation for the relation between missed targets and grants.

To identify potential downward earnings management, we appeal to prior literature that suggests two measures: total accruals (Dechow et al. 1995; Bradshaw et al. 2001; Richardson et al. 2002; Richardson et al. 2005) and deferred tax expense (Phillips et al. 2003; Joos et al. 2003; Phillips et al. 2004).[10] We posit that firms with extreme negative values of either of these two measures are more likely to have managed earnings downward than firms with less extreme values. We define an abnormal, industry-adjusted total accruals measure, *Accruals*, as the difference between net income (Compustat Data172) and operating cash flows (Compustat Data308), all deflated by total assets (Compustat Data6). To industry-adjust total accruals, we subtract the median accrual measure for each company's two-digit industry for that year.

We also use deferred tax expense to identify firms more likely to have managed earnings downward. Consistent with Phillips et al. (2003), we define *DefTax* as the deferred tax expense reported on the income statement (Compustat Data50), deflated by total assets.

We rank all firm-years in the Compustat database separately by *Accruals* and *DefTax*, partition these firm-years into quartiles, and obtain cut-offs for the lowest quartile for each industry (defined by two-digit SIC code) and year. We then classify our sample firm-years as belonging to the lowest quartile (i.e., a firm likely to have managed earnings downward), if their *Accruals* or *DefTax* measures fall below the respective cut-offs.

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[10] Prior studies find that deferred tax expense, a measure of the temporary differences between book income and taxable income, is associated with firms' objectives of meeting earnings targets or avoiding losses, consistent with the notion of earnings management.

Only firms that miss earnings targets via downward earnings management are relevant to our second hypothesis.[11] Thus, for *Miss* = 1 firms, we only retain observations whose *Accruals* and *DefTax* measures fall in the lowest quartile as defined above. This reduces the *Miss* = 1 sample to those firms with very large negative (earnings-decreasing) accruals, firms that are likely to have managed earnings downward. We retain all observations for *Miss* = 0 firms.[12] In addition, we continue to retain only the fixed-date grant observations to mitigate the possibility that our results are attributable to opportunistic timing rather than earnings management.

The subsamples we use to test H2 differ in size depending on which *Miss* variable we use as our dependent variable and on whether we identify likely earnings-management firms using *Accruals* or *DefTax*. Table 1 describes the total number of observations in each subsample as well as the number of observations identified as having missed the earnings target (i.e., firms where *Miss* = 1).

We will find support for H2 if β_1, the estimated coefficient on *Grants*, is positive because we hypothesize that CEOs who anticipate larger, subsequent option grants, will more likely manage earnings downward and miss earnings targets. Although we do not have formal hypotheses about *Exercises*, *Options*, *Bonus*, or *Stock*, we expect that these coefficients will be negative—missing an earnings target is inconsistent with CEOs maximizing the value of current period compensation or total wealth (Kadan and Yang 2006). Thus, other compensation components are "costs" in the CEO's rational cost-benefit tradeoff.

IV. RESULTS

Descriptive Statistics of Sample Demographics and Regression Variables

Table 2, Panel A presents descriptive statistics for our annual sample of 1,724 firms.[13] The sample includes small and large firms: the inter-quartile range of market capitalization ranges from $501 million to $4.3 billion. Comparing the mean and medians for total assets ($5.518 billion versus $1.138 billion) reveals that our sample includes some very large S&P 1500 firms. There is little dispersion of CEO salary, and bonuses are similarly clustered. However, salary and bonus typically represent only a small fraction of the average CEO's total compensation package. Sample firms have diverse stock option activity: the average CEO grant (exercise) has a fair value of $2.4 million ($1.9 million), but the median is only $791,000 ($0). Untabulated results show that CEOs receive option grants most years (72.5 percent of sample years) and about half of these grants are fixed-date (48.6 percent). CEO option exercises are more sporadic only 38.6 percent of years have exercises.

Table 2, Panel A also shows descriptive statistics for our regression variables. Both deferred tax expense and total accruals are negative on average, which is consistent with prior findings (e.g., Richardson et al. 2005). Scaled CEO compensation variables are economically significant to CEOs. Option grants are more than four times the CEOs salary and exercises are nearly three times annual salary. More significant yet are stock and options

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[11] Such misses could be due to alternative explanations discussed earlier. Our aim in H2 is simply to offer an additional explanation for the association between missed earnings targets and stock-option grants.

[12] The appropriate comparison group for the *Miss* = 1 firms is the full distribution of *Miss* = 0 firms and not those that just beat the earnings target. We use large negative accruals to identify earnings-management among *Miss* = 1 firms. On average, accruals for these firms are −0.22 of total assets. Firms that just-miss earnings targets have very small losses: 0.02, 0.01, and 0.005 of market value for *Miss_Zero*, *Miss_PriorYr*, and *Miss_Analysts*, respectively. Therefore, if the firm had not recorded such a large negative accrual, it would have met its earnings targets by a large margin. Nonetheless, we conduct robustness test with a reduced sample of *Miss* = 0 firms that just met targets and our results hold.

[13] For brevity, we tabulate descriptive statistics only for the annual sample and not the quarterly sample.

TABLE 2
Descriptive Statistics
Annual Data (1,724 firms, 7,916 firm years)

Panel A: Firm Demographics, CEO Compensation Characteristics, and OLS Regression Variables

	Mean	Standard Deviation	First Quartile	Median	Third Quartile
Firm demographics					
Assets ($ M)	5,518	19,675	424	1,138	3,704
Sales ($ M)	4,949	13,638	437	1,201	3,888
Market value ($ M)	7,107	22,690	501	1,341	4,257
Net income ($ M)	226	1,598	10	47	173
Return on assets	0.03	0.19	0.02	0.05	0.09
CEO compensation characteristics					
Salary ($ K)	621	333	392	558	794
Bonus ($ K)	653	1,197	111	373	788
Option grants ($ K)	2,447	7,807	208	791	2,243
Option exercises ($ K)	1,898	8,483	0	0	724
Options held ($ K)	13,417	56,082	442	2,624	9,458
Shares held ($ K)	59,070	453,806	1,735	6,233	20,322
Regression variables					
Deferred tax expense (% of assets)	−0.11	2.01	−0.62	0.06	0.83
Abnormal Accruals (% of assets)	−0.19	8.62	−3.59	0.26	4.05
Grants—Option grants to salary	4.48	8.44	0.90	1.99	4.41
Exercises—Option exercises to salary	2.64	7.77	0	0	1.37
Options—Options held to salary	18.17	42.81	0.91	4.83	15.73
Stock—Shares held to salary	72.74	233.19	3.20	10.56	34.61
Bonus—Bonus to salary	0.90	0.95	0.27	0.72	1.19
Gap-to-grant—Number of days from earnings announcement to grant date	121	108	22	90	202
Growth—Market-to-book ratio	3.87	9.89	1.66	2.52	4.03
Leverage—Long-term debt to assets	0.18	0.15	0.04	0.17	0.28

Panel B: Descriptive Statistics for Sample Partitioned by Missed Earnings Target

	Miss_Zero		*Miss_PriorYr*		*Miss_Analyst*	
	= 1	= 0	= 1	= 0	= 1	= 0
Total observations	622	5,762	1,495	4,447	1,502	2,351
Assets ($ M)	3,645	6,456	5,269	6,137	5,001	4,161
Sales ($ M)	2,904	5,888	4,651	5,724	4,713	4,355
Market value ($ M)	3,454	8,695	6,096	8,763	8,929	5,777
Net income ($ M)	(438)	383	(37)	384	192	261
Return on assets	−19%	7%	−5%	7%	0%	8%
Salary ($ K)	541	663	625	653	627	596
Bonus ($ K)	401	768	445	822	596	771
Option grants ($ K)	3,281	2,491	2,413	2,589	2,786	1,841
Option exercises ($ K)	1,151	2,166	1,248	2,407	2,285	2,057
Options held ($ K)	7,698	15,698	9,210	17,506	17,386	13,814

(*continued on next page*)

TABLE 2 (continued)

	Miss_Zero		*Miss_PriorYr*		*Miss_Analyst*	
	= 1	= 0	= 1	= 0	= 1	= 0
Shares held ($ K)	31,725	72,524	30,987	80,947	52,958	67,407
Grant—Option grants to salary	5.32	4.47	4.09	4.71	4.86	4.16
Exercises—Option exercises to salary	1.29	2.91	1.96	3.13	2.83	3.43

See Appendix for variable definitions.

held, which are, on average, 72 and 18 times the CEOs' salary, respectively. While the scaled regression variables are more normally distributed than the raw variables, the disparate means and medians indicate that the data are skewed, prompting us to also estimate rank regressions (see robustness tests, below).

Table 2, Panel C presents descriptive statistics separately for miss and non-miss observations. Firms that miss an earnings target are smaller and less profitable than firms that meet or beat targets. While bonus and salary are smaller, option grants are larger and exercises are smaller in dollar value. More telling, though, are the scaled compensation variables. Consistent with CEOs balancing competing incentives and opportunistically missing earnings targets, *Grants* (option grants to salary) are significantly higher for miss firms for *Miss_Zero* and *Miss_Analyst*, while *Exercises* are significantly lower for all three specifications of miss. These univariate results suggest that CEOs miss not only when they anticipate higher subsequent grants, but also when they anticipate lower subsequent exercises.

Descriptive Evidence on Missed Earnings Targets

We present evidence of both quarterly and annual missed earnings targets to document the incidence, frequency, and timing patterns of missed earnings targets. Our quarterly dataset includes a sample of 1,633 ExecuComp firms that ever granted fixed-date options in order to focus the analysis on the most relevant firms (see Table 3). For conciseness, we report results for firms that just miss reporting positive earnings because that definition is the most stringent; it classifies the fewest firms as having missed their target. Analyses of the other missed-target specifications do not differ significantly.

Table 3, Panel A shows the frequency of just-missed quarterly earnings targets. Conditional on just missing, about 43 percent of firms just miss only once during the sample period, 28 percent miss twice, and occurrences tail off after that. We extend our analysis, in Table 3 Panel B, to consider *strategic* misses—those that occur in the quarter immediately before fixed-date grants. For these strategic misses, the frequency pattern is dramatic—83 percent of firms just miss once, which suggests that our sample CEOs do not repeatedly just miss earnings targets before a fixed-date grant.

Table 3, Panel C presents descriptive evidence about the timing of just misses throughout the year. These misses are fairly evenly spread across the fiscal quarters (between 300 and 357 firms miss in each quarter). However, most misses that occur immediately before a fixed-date grant, happen in the first and fourth quarters: 69 (Q1) and 74 (Q4) misses compared to 14 (Q2) and 8 (Q3) misses. This is not accidental, untabulated results show that 80 percent of fixed-date grants are awarded in the first and second quarters (i.e., after quarters when targets are missed). Panel C also shows that very few firms miss in the

TABLE 3
Missed Quarterly Earnings Targets[a] for 1,633 firms, 54,934 Firm-Quarters

Number of Quarters with Missed Targets	Number of Unique Firms	Percent of Unique Firms	Number of Firm-Quarter Observations	Percent of Firm-Quarter Observations
Panel A: Frequency of Just-Missed Earnings Targets				
1	332	42.7	332	19.3
2	217	28.0	434	25.2
3	108	13.9	324	18.8
4	54	7.0	216	12.5
5	25	3.2	125	7.3
6 or more	40	5.2	292	16.9
Total	776	100.0	1,723	100.0
Panel B: Frequency of Just-Missed Earnings Targets in Quarter before Fixed-Date Option Grants				
1	132	83	132	67
2	19	12	38	20
3	6	4	18	9
4	2	1	8	4
5	0	0	0	0
6 or more	0	0	0	0
Total	159	100	196	100

(continued on next page)

TABLE 3 (continued)

Panel C: Timing of Just-Missed Earnings Targets

	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
	Number of Unique Firms	Percent	Number of Unique Firms	Percent	Number of Unique Firms	Percent	Number of Unique Firms	Percent
Firms that ever just miss a quarterly earnings target	355	100.0	300	100.0	301	100.0	357	100.0
Firms that just miss more than once	91	25.6	71	23.7	76	25.2	76	21.3
Firms that just miss in same quarter two years in a row (consecutive miss)	54	15.2	37	12.3	46	15.3	44	12.3
Firms that just miss in quarter before fixed-date option grant	69	19.4	14	4.7	8	2.7	74	20.7
Firms that just miss more than once in quarter before fixed-date option grant	12	3.4	2	0.7	1	0.3	8	2.2
Firms that just miss in quarter before fixed-date option grant in same quarter two years in a row (consecutive miss before fixed-date grant)	10	2.8	1	0.3	1	0.3	4	1.1

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[a] The earnings target is defined as zero earnings. We identify firms that just miss the target as those that report quarterly earnings scaled by lagged market value between −0.005 and 0.00.

The observations included in this table correspond to those reported in Figures 1 and 2, and Table 1, Panel A.

same quarter two or more years in a row, which provides consistent evidence that CEOs do not repeatedly strategically miss earnings targets.

Table 4 presents the annual frequency analysis for all three types of missed targets (Panel A) and for strategic misses (Panel B). Of the firms that miss annual targets, 28 percent miss more than once. However, only 18 percent of firms miss strategically, that is, before a fixed-option grant. These results show that firms do not strategically repeatedly miss earnings targets perhaps because CEOs surmise that doing so could increase the likelihood of detection and punishment.

Economic Significance of Missing Earnings Targets

A maintained hypothesis in our study is that a missed earning target depresses the firm's stock price, which benefits the CEO via lower option strike prices. Before we test our two hypotheses, we provide some high-level evidence on the stock price reaction to missed earnings targets. We use all firm-years available in Compustat for the fiscal years 1992–2005 and retain only those firm years that miss or beat any of the three earnings targets. We accumulate seven-day market-adjusted returns, centered on the earnings announcement date. We find that firms that just-miss earnings targets have statistically significant negative cumulative abnormal returns (CAR), on average. Moreover, the average

TABLE 4

Missed Annual Earnings Targets[a] for 1,552 Firms, 6,384 Firm-Years

Number of Years with *Miss_Zero* = 1	Number of Unique Firms	Percent of Unique Firms	Number of Firm-year Observations	Percent of Firm-Year Observations
Panel A: Frequency of Missed Earnings Targets				
1	324	71.9	324	52.1
2	93	20.6	186	29.9
3	27	6.0	81	13.0
4	5	1.1	20	3.2
5	1	0.2	5	0.8
6	1	0.2	6	1.0
Total	451	100.0	622	100.0
Observations that miss two years in a row			78	12.5
Observations that miss three years in a row			16	2.5
Panel B: Frequency of Missed Earnings Targets before Fixed-Date Option Grants				
1	146	81.6	146	66.1
2	24	13.4	48	21.7
3	9	5.0	27	12.2
Total	179	100.0	221	0.0
Observations that miss two years in a row			18	8.1
Observations that miss three years in a row			3	1.4

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[a] The earnings target is defined as *Miss_Zero*: observations with small loss or big bath.
See Appendix for variable definitions.
Observations in Panel A correspond to the observations included in logistic regression in Table 5, Panel A.
Observations in Panel B correspond to the observations included in logistic regression in Table 5, Panel B.

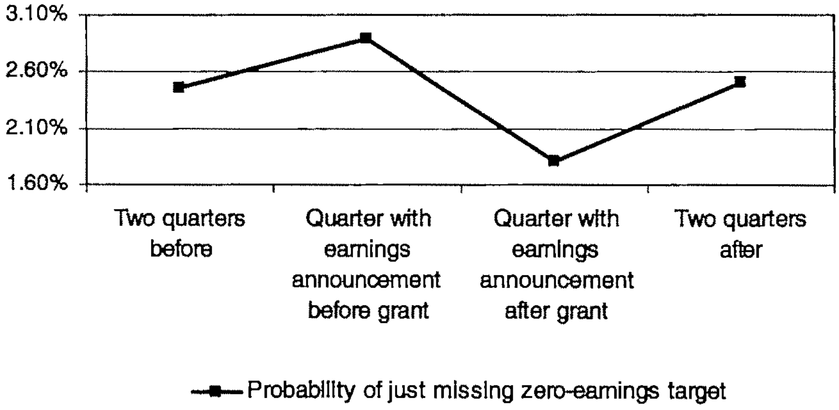
seven-day CAR for firms that miss the earnings target by a wide margin is economically, as well as statistically, significant: average CAR is −1.5 percent for big bath firms, −0.85 percent for firms that report large earnings declines and −0.58 percent for firms that seriously miss analysts' forecasts. More importantly, returns for miss firms are statistically lower than for beat firms: the mean difference between CAR for miss and beat firms is −0.46 percent for *Miss_Zero* firms (p = 0.027), −0.17 percent for *Miss_PriorYr* firms (p = 0.09), and −1.47 percent for *Miss_Analyst* (p = 0.024). This analysis provides initial evidence that missing earnings targets can be a potentially successful strategy for CEOs who seek to increase personal wealth.

Results of Tests of H1

We use quarterly and then annual data to test H1. Untabulated data show that option grants are larger after a missed quarterly earnings target (*Miss_Zero*) both in dollars ($2.1 million compared to $1.3 million) and relative to total CEO salary (2.33 compared to 1.67). Further, we find that the probability of firms' just missing quarterly earnings targets immediately before fixed-option grant dates is abnormally higher than their own time-series average (Figure 1). Given that all of these differences are statistically significant, we conclude that executive stock-option grants are positively related to missed earnings targets.

Equation (1), our multivariate logistic regression model, allows us to control econometrically for conflicting CEO incentives and other firm-level factors that may affect the likelihood of missing an earnings target. Table 5, Panel A reports results for each of the three *Miss* variables. All three model specifications have significant explanatory power and ROC curve statistics indicate a good model fit. The estimated coefficient on *Grants* is positive in all three specifications, which indicates that the likelihood of missing an earnings

FIGURE 1
Incidence of Just Missing Earnings Target[a] Before and After Fixed-Date Option Grants
Quarterly Data for 1,633 Firms, 54,934 Firm-Quarters



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[a] The earnings target is defined as zero earnings.

Figure 1 includes firms that just miss the target by reporting quarterly earnings scaled by lagged market value between −0.005 and 0.00.

The observations included correspond to those reported in Table 1, Panel A, and Table 3.

TABLE 5
Logistic Regressions of Missed Earnings Target on Stock-Option Grants, CEO Incentives, and Firm-Level Controls

$$Miss_{it} = \beta_0 + \beta_1 \times Grants_{it+1} + \Sigma\, \beta_k \times CEO\_Incentive_{kit} + \Sigma\, \beta_s \times Control_{sit} + \varepsilon_{it} \quad (1)$$

Panel A: Tests of Incentives to Miss Earnings Target Using Full Sample (Logistic Regression Uses Annual Data and Includes All Option-Grant Observations)

		Miss = Miss_Zero		*Miss = Miss_PriorYr*		*Miss = Miss_Analyst*	
Variable	**Predicted Sign**	**Estimate**	**p-value**	**Estimate**	**p-value**	**Estimate**	**p-value**
Intercept		−9.726	0.953	−1.282	0.130	−0.724	0.425
Grants	+	0.041	0.001	0.015	0.001	0.021	0.001
Exercises	−	−0.042	0.001	0.004	0.267	−0.012	0.011
Options	−	0.000	0.446	−0.005	0.001	0.002	0.089
Bonus	−	−0.938	0.001	−0.801	0.001	−0.444	0.001
Stock	+/−	−0.001	0.001	−0.001	0.001	0.000	0.083
Gap_to_Grant	−	−0.001	0.111	0.000	0.908	0.000	0.147
Leverage	+/−	2.032	0.001	0.684	0.001	0.387	0.130
Size	+/−	−0.283	0.001	0.064	0.003	0.161	0.001
Growth	+/−	−0.007	0.315	−0.001	0.421	0.007	0.291
Year fixed effects		Yes		Yes		Yes	
Industry fixed effects		Yes		Yes		Yes	
Total number of observations (n)		6,384		5,942		3,853	
Number of *Miss* = 1 observations		622		1,495		1,502	
Adjusted R^2		16.2%		11.6%		8.2%	
LR χ^2		510.1		483.7		239.5	
Probability		0.001		0.001		0.001	
ROC Curve c-statistic		0.774		0.701		0.649	

(*continued on next page*)

TABLE 5 (continued)

Panel B: Tests of Incentives to Miss Earnings Target Using Only Fixed-Date Grant Sample (Logistic Regression Uses Annual Data and Includes Only Observations with Fixed-Date Grants)

Variable	Predicted Sign	*Miss* = *Miss_Zero*		*Miss* = *Miss_PriorYr*		*Miss* = *Miss_Analyst*	
		Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept		−10.568	0.960	−1.471	0.218	−0.962	0.356
Grants	+	0.064	0.001	0.021	0.025	0.021	0.015
Exercises	−	−0.073	0.001	0.000	0.490	−0.006	0.243
Options	−	0.004	0.133	−0.003	0.062	0.003	0.057
Bonus	−	−1.293	0.001	−0.892	0.001	−0.464	0.001
Stock	+/−	−0.001	0.089	−0.001	0.074	0.000	0.309
Gap_to_Grant	−	−0.001	0.095	0.000	0.478	0.000	0.141
Leverage	+/−	2.393	0.001	0.610	0.092	0.264	0.503
Size	+/−	−0.186	0.002	0.105	0.002	0.167	0.001
Growth	+/−	−0.045	0.124	−0.039	0.019	0.012	0.178
Year fixed effects		Yes		Yes		Yes	
Industry fixed effects		Yes		Yes		Yes	
Total number of observations (n)		3,276		2,999		1,953	
Number of *Miss* = 1 observations		221		687		701	
Adjusted R^2		17.6%		12.8%		9.7%	
LR χ^2		232.6		264.8		142.7	
Probability		0.001		0.001		0.001	
ROC Curve c-statistic		0.792		0.708		0.619	

See Appendix for variable definitions.

target increases with the magnitude of subsequent option grants. Sensitivity tests show that option grants are economically significant in CEOs' decision to miss an earnings target. For example, in the *Miss_Zero* regression, increasing *Grants* by one standard deviation from the mean increases the probability of missing the earnings target by 64 percent (from 6.75 percent to 11 percent). From the strong positive coefficient on *Grants*, we conclude that CEOs are not systematically punished (with reduced option grants) after missing earnings targets. Many of the CEO incentives and firm-level controls are significant. For example, *Bonus* is significant in all regressions and *Exercises* is significant in most regressions in the predicted directions. The firm-level control variables (*Gap_to_Grant*, *Leverage*, and *Growth*) are largely insignificant. The results on *Size* are mixed: negative in the *Miss_Zero* specification and positive in the other two models.

The positive association we document between *Miss* and *Grants* could result from three alternative explanations, which the tests in Table 5, Panel A cannot distinguish. First, grants might be opportunistically timed to coincide with missed earnings targets. To control for this explanation, we include only fixed-date option grants and re-estimate Equation (1). As Table 5, Panel B shows, our sample size decreases by nearly half, but all three models' explanatory power increases slightly. More importantly, we continue to find a positive association between *Miss* and *Grants* indicating that backdated and opportunistically timed options do not completely explain the positive association that we document.

Second, the positive association between *Miss* and *Grants* is consistent with boards using grants to encourage better future performance (i.e., missed targets lead to larger grants). Third, managers who face strong option-grant incentives could manage earnings downward to miss earnings targets (i.e., anticipated larger grants lead to missed targets). The next section attempts to disentangle the encouragement and earnings management explanations, by identifying firms that are likely to have managed earnings.

Results of Tests of H2

To implicate earnings management, we exclude observations where misses could be due to operational reasons. We re-estimate Equation (1) using all $Miss = 0$ firms, but only the subsample of $Miss = 1$ firms with the largest negative (i.e., lowest quartile by industry and year) accruals or deferred tax expense—those firms for which downward earnings management is most likely. In the process, we also control for the encouragement explanation because encouragement option grants presumably follow operational misses. Table 6, Panel A reports results of tests that use the largest negative abnormal accruals to indicate downward earnings management. Similarly, Panel B uses the largest negative deferred tax expense to indicate downward earnings management.

Both Panels A and B of Table 6 report a significant positive coefficient on *Grants* for all three specifications of the *Miss* variable, consistent with the notion that the likelihood of downward earnings management and missing earnings target increases when CEOs anticipate large fixed-date stock-option grants. The coefficient on annual cash bonus is large, negative, and significant in all three model specifications indicating that CEOs consider the consequence of missing an earnings target on immediate cash inflow (*Bonus*). Our results suggest that the decision about whether and how to manage earnings is a strategic decision and our estimated negative coefficients on other CEO incentive variables provide some evidence of this trade-off of incentives. Again, the firm-level control variables are largely insignificant in this regression. Panel B shows similar results—the relation between *Miss* and *Grants* is positive and significant and certain CEO incentive variables are negative and significant as expected.

TABLE 6

Logistic Regressions of Missed Earnings Target on Stock-Option Grants, CEO Incentives, and Firm-Level Controls for a Sample of Firms Likely to Have Managed Earnings Downward

$$Miss_{it} = \beta_0 + \beta_1 \times Grants_{it+1} + \Sigma\ \beta_k \times CEO\_Incentive_{kit} + \Sigma\ \beta_s \times Control_{sit} + \varepsilon_{it} \qquad (1)$$

		Miss = *Miss_Zero*		*Miss* = *Miss_PriorYr*		*Miss* = *Miss_Analyst*	
Variable	**Predicted Sign**	**Estimate**	**p-value**	**Estimate**	**p-value**	**Estimate**	**p-value**
Panel A: Downward Earnings Management Determined by Industry-Adjusted Accruals (Logistic Regression Uses Annual Data and Includes Only Observations with Fixed-Date Grants)							
Intercept		−9.067	0.954	−9.939	0.958	−7.208	0.967
Grants	+	0.056	0.001	0.051	0.001	0.052	0.002
Exercises	−	−0.040	0.043	−0.014	0.165	−0.015	0.203
Options	−	0.008	0.010	0.002	0.289	0.005	0.001
Bonus	−	−1.142	0.001	−0.973	0.001	−0.777	0.001
Stock	+/−	−0.002	0.133	−0.001	0.162	0.000	0.378
Gap_to_Grant	−	−0.003	0.007	−0.001	0.198	−0.001	0.117
Leverage	+/−	2.635	0.001	0.848	0.163	0.885	0.248
Size	+/−	−0.331	0.001	−0.057	0.331	−0.088	0.271
Growth	+/−	−0.014	0.550	−0.042	0.148	−0.005	0.835
Year fixed effects		Yes		Yes		Yes	
Industry fixed effects		Yes		Yes		Yes	
Total number of observations (n)		3,150		2,510		1,379	
Number of *Miss* = 1 observations		95		198		127	
Adjusted R^2		16.22%		12.56%		16.08%	
LR χ^2		123.51		137.48		105.81	
Probability		0.001		0.001		0.001	
ROC Curve c-statistic		0.806		0.735		0.756	

(*continued on next page*)

TABLE 6 (continued)

Panel B: Downward Earnings Management Determined by Deferred Tax Measure (Logistic Regression Uses Annual Data and Includes Only Observations with Fixed-Date Grants)

Intercept		−11.835	0.952	−12.543	0.950	−20.886	0.911
Grants	+	0.046	0.005	0.037	0.008	0.035	0.015
Exercises	−	−0.069	0.024	0.000	0.498	−0.022	0.086
Options	−	0.009	0.017	0.002	0.456	0.008	0.002
Bonus	−	−1.344	0.001	−1.003	0.213	−0.516	0.001
Stock	+/−	−0.001	0.267	−0.001	0.001	−0.001	0.081
Gap_to_Grant	−	−0.001	0.316	0.000	0.176	−0.001	0.149
Leverage	+/−	0.437	0.628	0.241	0.706	0.089	0.914
Size	+/−	0.009	0.913	0.055	0.353	0.148	0.063
Growth	+/−	−0.149	0.038	−0.125	0.005	−0.015	0.569
Year fixed effects		Yes		Yes		Yes	
Industry fixed effects		Yes		Yes		Yes	
Total number of observations (n)		3,142		2,500		1,364	
Number of *Miss* = 1 observations		87		188		112	
Adjusted R^2		14.27%		13.09%		12.35%	
LR χ^2		101.92		139.13		74.99	
Probability		0.001		0.001		0.001	
ROC Curve c-statistic		0.784		0.749		0.726	

See Appendix for variable definitions.

Taken together, our Tables 5 and 6 results lead us to conclude that the likelihood of missing earnings targets for firms that manage earnings downward increases with CEO stock-option grants. Our results cannot be attributed to opportunistic timing of option grants (such as after the missed target is reported) or to option backdating because our tests include only fixed-date grants, which by definition cannot be opportunistically timed or backdated. Neither can our results be explained by happenstance missed targets (followed by grants to encourage better future performance) because our tests only include firms that likely managed earnings downward to miss earnings targets. Our results bring to light a specific situation in which a CEO's option-induced incentives to maximize personal wealth appear to prevail over other personal and firm-level incentives to meet or beat earnings targets. The exact boundary conditions of this trade-off remain a topic for future research.

Additional Tests

Our findings might suggest irrational CEO behavior. However, we control empirically for conflicting incentives (Fields et al. 2001), which enables us to conclude that the choice to miss a target is based on the CEO's rational, *ex ante* cost-benefit trade-off. Nonetheless, the behavior that we document could be irrational if it was repeated so often that the CEO might reasonably anticipate being caught and punished or if the CEO did not expect a stock-price rebound before he/she exercised options or sold stock. We perform additional tests to rule out both scenarios.

First, to evaluate whether CEOs strategically, repeatedly miss earnings targets, we assess the frequency of *Miss_Zero* both quarterly and annually (see Table 4). We find that while a number of firms miss earnings targets more than once (perhaps for operational reasons), very few firms strategically miss earnings targets more than once (that is, before fixed-date option grants). Thus, conditional on missing targets, we do not find any evidence that CEOs repeatedly miss targets for strategic reasons more often than for operational reasons.

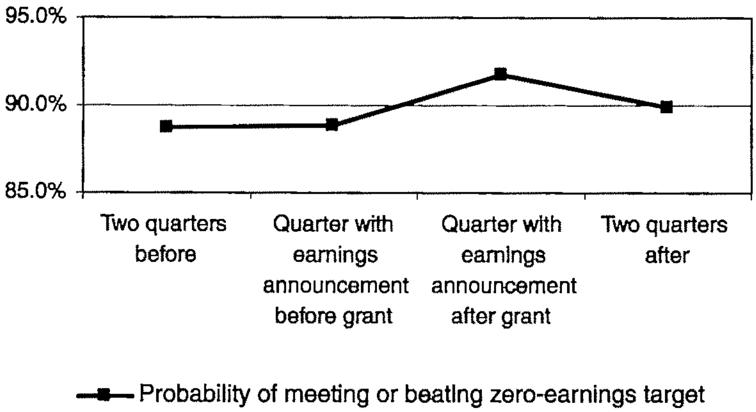
Second, we address the stock-price rebound issue indirectly because it is difficult to document statistically significant stock price changes with a sample the size of ours. To understand our indirect tests, bear in mind that our sample of $Miss = 1$ firms includes only observations with significant negative abnormal accruals. Prior accounting literature establishes that accruals reverse predictably (e.g., Sloan 1996; Subramanyam 1996) and that the market overvalues the accrual portion of net income (e.g., Sloan 1996). Thus, to effectuate a stock price rebound, the CEO simply reverses the accrual (Burgstahler et al. 2002; Kadan and Yang 2006).

To test this reversal/rebound notion, we assess the change in the frequency of meet/beat before and after fixed-date grants. The spirit of these tests is that meet/beat is positively associated with income-increasing accruals (e.g., Marquardt and Wiedman 2004). Figure 1 shows that although the probability of firms missing quarterly earnings targets just before fixed-option grant dates is abnormally higher than such firms' own time-series average, this abnormal difference reverses in the very next quarter after the fixed-date grants. Figure 2 shows that the probability of beating earnings targets increases significantly immediately following the fixed-grant dates. From these additional results, we conclude that missing an earnings target can be a rational executive decision.

Robustness Tests

We perform a battery of robustness tests, none of which alter our main inferences in a statistically significant way. We describe each of these robustness tests, as follows: (1) We define miss by using alternative ranges for losses, earnings declines, and analyst-misses,

FIGURE 2
Incidence of Meeting or Beating Earnings Target[a] Before and After Fixed-Date Option Grants Quarterly Data for 1,633 Firms, 54,934 Firm-Quarters



[a] The earnings target is defined as zero earnings.

Figure 2 includes firms that meet or beat the target by reporting zero or positive quarterly earnings.
The observations correspond to those reported in Table 1, Panel A, and Table 3.

and also by deflating by assets instead of beginning market value. (2) We deflate compensation variables by total current compensation (TCC in ExecuComp) instead of salary. (3) We run reverse regression in order to test our earnings management hypothesis. In particular, these reverse models regress option grants on missed earnings targets while controlling for determinants of CEO compensation. (4) We use ranks instead of continuous values in order to address non-normality of key regression variables. (5) We include a sensitivity measure to control for the effect of the CEO's existing option holdings on the earnings management decision (Core and Guay 1999). For this sensitivity measure, we separately calculate values for vested and unvested options and assume that the average in-the-moneyness of stock options held is in-the-money value (ExecuComp variables INMONEX and INMONUN) divided by the number of options held (ExecuComp variable UEXNUMEX and UEXNUMUN). Then we calculate the strike price (X) as ending price (S) less in-the-moneyness calculated above. For vested options, we assume a remaining life of five years and for unvested options, we assume seven years. We include this sensitivity measure in each regression presented in Tables 5 and 6 and all are robust except one logistic regression that is based on *Miss_PriorYr*—middle column in Table 5, Panel B. In this regression only, we lose significance on β_1. (6) It is possible that managers exercise their vested stock options before they announce missing earnings targets. To control for any strategic advance option exercises, we run all Tables 5 and 6 regressions with option exercises measured in the same year that we measure miss or non-miss. (7) To further control for the encouragement story, we remove all firm-years with abnormal increases (greater than 20 percent increase) in the proportion of stock-option grants to total compensation. (8) It is possible that missed earnings targets lead to salary-cuts, which mechanically increases the option grants to salary ratio. This may cause a spurious positive correlation between missing earnings targets and subsequent grants that are scaled by CEO salary. Accordingly, we run our tests after removing all firm-years with (a) significant salary cuts

(20 percent cut in salary) and (b) with significant salary decreases that are greater than the decrease in option grants. (9) Abnormal accruals may arise from merger and acquisition activity. To control for this possibility, we code an indicator variable for all firm-years with a year-over-year increase in assets greater than 25 percent. We add this indicator variable to all logistic regression models in Tables 5 and 6. (10) We re-estimate our regressions for a sample that includes only fixed-date grant firms with small misses. Doing so drastically reduces our sample and the statistical power. Nonetheless, our results are robust when we define *Miss* as a very small-loss (just miss) and as a small miss of analysts' forecasts. Results for the third *Miss* specification (based on earnings decline) are in the right direction but are no longer statistically significant.

V. CONCLUSIONS

Using CEO compensation data for a broad cross-section of firms for the years 1992–2005, we pinpoint an important situation in which CEO and firm-level incentives sharply conflict, namely when anticipated option grants create incentives for CEOs to miss critical earnings targets, thereby increasing the CEO's personal wealth. In particular, we find that firms are more likely to miss earnings targets just before large CEO option grants. Our results are consistent with CEOs balancing competing personal incentives created by grants versus option exercises, option and stock holdings, and cash compensation as well as firm-level factors. These tests highlight a situation where CEOs might trade-off firm value to enhance personal wealth. To mitigate such trade-offs, boards could step up oversight following missed targets to improve detection. Alternately, compensation committees could restructure incentive contracts. For example, compensation contracts might include a high-water-mark provision that sets the strike price of each period's option grants equal to the stock's all time or annual high value (Carpenter 2000).

Our findings make several contributions to the accounting literature. First, while many prior studies ascertain that firms deliberately meet or beat earnings targets, ours is the first study to document incentives for firms to miss earnings targets. Missing an earnings target is particularly egregious because stock prices are likely to tumble—an outcome clearly inconsistent with shareholders' interests. In addition, we add to the body of evidence on downward earnings management. Indeed we show that, conditional on the magnitude of subsequent stock-option grants, the shape of the earnings distribution changes, with unexpectedly higher density just to the left of earnings thresholds (Burgstahler and Dichev 1997).

Second, we simultaneously consider grants (which create incentives to manage earnings downward) and exercises and/or option holdings (which create incentives to manage earnings upward). Thus, our model effectively responds to calls for research to consider conflicting incentives (Fields et al. 2001).

Third, we show that meeting or beating an earnings target is not a necessary condition for earnings management. Burgstahler and Dichev's (1997) now-famous graph of the cross-sectional earnings distribution, shows a trough in the distribution just to the left of zero and a spike just to the right. From this, Burgstahler and Dichev (1997) conclude that firms try to avoid falling into the trough. Our paper suggests that some firms try to fall into the trough. Indeed, we know of no published paper that specifically considers that missed earnings targets may indicate earnings management (as opposed to the lack thereof). Our study fills a void in the literature and could lead to further research that explores missed earnings targets.

Fourth, consistent with recent studies on opportunistic timing of option grants (Heron and Lie 2007), we document that managers time their options after missing earnings targets. However, opportunistic timing, backdating, and boards of directors' encouragement efforts cannot explain all instances of missed earnings targets preceding large option grants. Our study implicates earnings management as an additional explanation of missed earnings targets that precede large CEO option grants.

APPENDIX
VARIABLE DEFINITIONS FOR ALL TESTS AND TABLES

Assets = Compustat Data6.

Sales = Compustat Data12.

Net income = Compustat Data172.

Market value = Common shares outstanding (Compustat Data25) × fiscal year end closing price (Compustat Data199).

Return on assets = Net income (Data172)/Total assets (Data6).

EPS = EPS excluding extraordinary items (Compustat Data57).

Salary = ExecuComp SALARY.

Bonus = ExecuComp BONUS.

Option grants = ExecuComp BLK_VALU.

Option exercises = ExecuComp SOPTEXER.

Options held = ExecuComp INMONEX + ExecuComp INMONUN.

Shares held = ExecuComp SHROWN × ExecuComp PRCCF + ExecuComp RSTKHLDV.

Miss_Zero = Annual data: defined as 1 if earnings (Compustat Data172) divided by lagged market value (Data25 × Data199) is less than 0.00 but greater than −0.02, and 0 otherwise, or if earnings (Compustat Data172) divided by lagged market value (Data25 × Data199) is less than 0.00 and is in lowest quartile for that two-digit industry for that year, and 0 otherwise. Quarterly data: defined as 1 if earnings (Compustat Data69) divided by lagged market value (Data14 × Data61) is less than 0.00 but greater than −0.005, or if earnings (Compustat Data172) divided by lagged market value (Data25 × Data199) is less than 0.00 and is in lowest quartile for that two-digit industry for that quarter, and 0 otherwise.

Miss_PriorYr = Defined as 1 if change in earnings (Compustat Data172) divided by lagged market value (Data25 × Data199) is less than 0.00 but greater than −0.01, or if change in earnings (Compustat Data172) divided by lagged market value (Data25 × Data199) is less than 0.00 and is in lowest quartile for that industry for that year, and 0 otherwise.

Miss_Analyst = Defined as 1 if EPS minus last analysts' median forecast (I/B/E/S MEDEST) divided by price per share (CRSP PRC) is less than 0.00 but greater than −0.005, or if EPS minus last analysts' median forecast (I/B/E/S MEDEST) divided by price per share (CRSP PRC) is less than −0.1, and 0 otherwise.

Accruals = Net income (Compustat Data72) − net operating cash flow (Compustat Data308) deflated by assets (Compustat Data6), less median accruals to assets ratio for two-digit industry for that year, reported in percent.

DefTax = Deferred-tax expense (Compustat Data50), deflated by assets (Compustat Data6), reported in percent.

Grants = Option grants (ExecuComp BLK_VALU) deflated by Salary (ExecuComp SALARY), winsorized at the 99th percentile.

Fixed-date grants = We determine option grant date from the options expiration date (ExecuComp EXDATE) and assume that the options have full years of life before expiration. We code a grant as fixed-date, if the option-grant date is within 14 days of the option-grant date in either of the previous two fiscal years.

Exercises	=	Option exercises (ExecuComp SOPTEXER) deflated by Salary (ExecuComp SALARY), winsorized at the 99th percentile.
Gap_to_Grant	=	The number of calendar days between earnings announcement date and option-grant date.
Options	=	Options held (ExecuComp INMONEX + ExecuComp INMONUN) deflated by Salary (ExecuComp SALARY), winsorized at the 99th percentile.
Stock	=	Shares held (ExecuComp SHROWN × ExecuComp PRCCF + ExecuComp RSTKHLDV) deflated by Salary (ExecuComp SALARY), winsorized at the 99th percentile.
Bonus	=	Bonus (ExecuComp BONUS) deflated by Salary (SALARY), winsorized at the 99th percentile
Growth	=	Market-to-book ratio: (Compustat Data25 × Compustat Data199)/ ExecuComp SEQ.
Leverage	=	Long-term debt (Compustat Data9) divided by total assets (Compustat Data6).
Industry fixed effects	=	Indicator variables for each one-digit SIC, defined as 1 if the firm belongs to that industry, and 0 otherwise.
Market-adjusted return	=	Holding period return (CRSP RET) − market return (CRSP VWRETD).
Cumulative market-adjusted return	=	Market-adjusted return compounded over seven trading days centered on the earnings announcement date.

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The Effect of SOX Internal Control Deficiencies and Their Remediation on Accrual Quality

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ABSTRACT: This paper investigates the effect of internal control deficiencies and their remediation on accrual quality. We first document that firms reporting internal control deficiencies have lower quality accruals as measured by accrual noise and absolute abnormal accruals relative to firms not reporting internal control problems. Second, we find that firms that report internal control deficiencies have significantly larger positive and larger negative abnormal accruals relative to control firms. This finding suggests internal control weaknesses are more likely to lead to unintentional errors that add noise to accruals than intentional misstatements that bias earnings upward. Third, we document that firms whose auditors confirm remediation of previously reported internal control deficiencies exhibit an increase in accrual quality relative to firms that do not remediate their control problems. Finally, we find firms that receive different internal control audit opinions in successive years exhibit changes in accrual quality consistent with changes in internal control quality. Collectively, our cross-sectional and intertemporal change tests provide strong evidence that the quality of internal control affects the quality of accruals.

Keywords: *SOX; internal control; accrual quality; financial reporting reliability.*

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I. INTRODUCTION

The reliability of financial reporting is claimed to be a function of the effectiveness of a firm's internal control (PCAOB 2004; Donaldson 2005).[1] However, research to date provides mixed evidence on whether internal control weaknesses adversely affect accrual quality, an important component of reliable financial statements (Hogan and Wilkins 2005; Bedard 2006; Doyle et al. 2007). This paper uses recently available data on the effectiveness of firms' internal controls mandated by the Sarbanes-Oxley Act (SOX) and the PCAOB's Auditing Standards (AS) No. 2 to investigate how internal control quality affects the reliability of financial information (U.S. Congress 2002; PCAOB 2004). We posit that if a firm has weak internal control, managers are less able to determine reliable accrual amounts, and a consequence of these unintentional misrepresentations is that financial information is more noisy and less reliable. In addition, managers of firms with weak internal control can more readily override the controls and intentionally prepare biased accrual estimates that facilitate meeting their opportunistic financial reporting objectives. Thus, regardless of whether misstatements are unintentional or intentional, the quality of accruals is likely diminished when firms have weak internal controls.

We use SOX-mandated internal control deficiency (ICD) disclosures and external auditor opinions on internal control to conduct both cross-sectional and within-firm intertemporal change tests of whether the effectiveness of firms' internal control affect the quality of reported accruals. Specifically, we test whether: (1) firms that have ICDs exhibit noisier accruals and larger abnormal accruals (both absolute and signed) relative to firms not disclosing ICDs; (2) firms whose external auditors verify remediation of previously disclosed ICDs subsequently exhibit higher quality accruals relative to firms failing to remediate their control problems; and (3) firms that receive different SOX 404 audit opinions in successive years exhibit improvements (declines) in accrual quality consistent with strengthened (weakened) internal controls indicated by the different opinions.

To conduct our tests, we identify a sample of firms that have at least one SOX 404 audit opinion on internal control (i.e., accelerated filers). We look back to determine whether a sample firm disclosed an ICD under SOX 302 and look forward to see if the firm received a second SOX 404 opinion.[2] Managements' prior internal control disclosures in combination with external audit reports allow us to conduct change analysis tests to provide strong evidence on whether weak internal control diminishes the quality of firms' reported accruals.

In cross-section tests, we find that ICD firms have larger absolute, larger positive, and larger negative abnormal total and abnormal working capital accruals relative to non-ICD firms. In addition, we find that accruals of ICD firms map less reliably to past, current, and future cash flows. All of these results are consistent with the accruals of ICD firms being noisier and less reliable relative to accruals of firms with no reported internal control problems. These results hold after controlling for conditional conservatism and firm characteristics that prior research has shown to be related to accrual quality. As to intertemporal changes in the effectiveness of internal controls, we find that firms that disclose an internal control problem and subsequently receive an unqualified SOX 404 audit opinion exhibit a decrease in absolute abnormal accruals relative to the year when internal control problems are first reported. We find no evidence that this decrease is due to firms becoming more conservative in their accounting choices. In contrast, firms identified as having internal control problems that subsequently receive an adverse SOX 404 opinion exhibit no significant change in the magnitude of abnormal accruals.

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[1] In Auditing Standards No. 2, the Public Company Accounting Oversight Board (PCAOB 2004) states: "The Board believes that effective controls provide the foundation for reliable financial reporting. Congress believed this too, which is why the new reporting by management and the auditor on the effectiveness of internal control over financial reporting received such prominent attention in the [SOX] Act. Internal control over financial reporting enhances a company's ability to produce fair and complete financial reports. Without reliable financial reports, making good judgments and decisions about a company becomes very difficult for anyone, including the board of directors, management, employees, investors, lenders, customers, and regulators. The auditor's reporting on management's assessment of the effectiveness of internal control over financial reporting *provides users of that report with important assurance about the reliability of the company's financial reporting*" (para. E.5., Appendix E, Background and Basis for Conclusions) (emphasis added).

[2] Section 302 of SOX, which became effective in August 2002, requires senior management to evaluate internal controls over financial reporting and certify the effectiveness of the controls (see Ashbaugh-Skaife et al. [2007] for a discussion of the SOX 302 reporting requirements). Section 404 of SOX requires that public company annual filings contain management's assessment of the design and operating effectiveness of its internal control and that the external auditor provide an opinion on management's assessment (Securities and Exchange Commission [SEC] 2002). Auditing Standards No. 2 (AS No. 2) requires that the auditor form and express a separate opinion on the auditor's evaluation of internal control. We refer to the auditor's own opinion as the "SOX 404 opinion."

Our analysis of successive year SOX 404 opinions reveals that firms whose internal controls improve (going from adverse to unqualified SOX 404 opinions) exhibit a modest increase in accrual quality, while firms whose internal controls worsen (going from unqualified to adverse SOX 404 opinions) exhibit a significant decrease in accrual quality. Firms with the same SOX 404 opinion in successive years (unqualified or adverse in both years) exhibit no change in accrual quality.

Collectively, our cross-sectional and intertemporal change tests are consistent with the notion expressed by Congress and regulators that strong internal controls provide a significant long-term benefit in improving the accuracy of financial reporting that leads to higher quality information for firms' external stakeholders (Donaldson 2005; U.S. House of Representatives 2005; U.S. Senate 2002, 2004).

Our study makes several contributions. First, we add to the literature that seeks to identify the determinants of accrual quality, much of which focuses on innate firm operating characteristics as the primary determinants of accrual quality (Dechow and Dichev 2002; Dechow et al. 1995; Francis et al. 2004; Kothari et al. 2005) or intentional misuse of accounting discretion to manipulate earnings through accruals (Dechow et al. 1996). Our study is one of the first to investigate how internal control, which is intended to attenuate both intentional and unintentional misstatements, affects the quality of accruals and thereby the reliability of financial statements. We empirically link the strength of firms' internal control over financial reporting to the quality of accruals through the use of SOX 302 and SOX 404 reporting. Most importantly, because independent auditors' SOX 404 opinions provide unambiguous signals about *changes* in the effectiveness of firms' internal controls, our research design allows tests of the effects of changes in internal control quality on accrual quality in ways that minimize competing explanations for our results.

This study also contributes to the literature designed to assess the financial reporting consequences of SOX. While much of the prior literature addresses the costs of implementing and auditing SOX requirements (Li et al. 2008; Zhang 2007; Berger et al. 2005), our study is among the first to provide evidence about potential benefits of strong internal control in terms of the quality of externally reported financial information.

Our research is most closely related to concurrent studies by Hogan and Wilkins (2005), Bedard (2006), and Doyle et al. (2007) that examine the relation between internal control weaknesses and earnings (accrual) quality. Hogan and Wilkins (2005) find no difference in the Dechow and Dichev (2002) measure of accrual noise between ICD firms and a set of control firms and only modest differences in absolute abnormal total accruals using the modified Jones model (Dechow et al. 1995). Bedard (2006) finds no difference in the absolute value of unexpected total accruals between ICD and control firms in the two years prior to the ICD firms' disclosures and in the two years that follow disclosure. However, Bedard (2006) finds that ICD firms exhibit larger absolute abnormal accruals relative to control firms in the disclosure year. Doyle et al. (2007) find that firms that disclosed ICDs under SOX 302 (before required internal control audits) exhibit lower accrual quality relative to control firms, but these differences relate only to overall company level control problems and not to account specific weaknesses. Interestingly, Doyle et al. (2007) find no differences in accrual quality between ICD and non-ICD firms for internal control weaknesses disclosed during the SOX 404 regime.

Our study extends these prior studies in several important ways. First, all three of the prior studies are restricted to cross-sectional tests of differences in accrual quality between ICD and non-ICD firms. Accordingly, as in all cross-sectional designs, there are potential concerns of endogeneity, self-selection, and correlated omitted variables, which limit the ability to draw strong causal inferences from the results.[3] We address these concerns by focusing on firms that received one or more SOX 404 opinions and identify which firms have continuously good, continuously bad, or changes in the quality of their internal control.

Incorporating SOX 404 opinions is a central feature of our research design and is important because: (1) it provides an unambiguous signal from an independent third-party about the effectiveness of a firm's internal control; (2) it allows identification of which firms were able to remediate internal control weaknesses and when the improvement took place; and (3) it allows identification of subsets of firms that experienced significant changes in internal controls from year to year. In contrast to the prior studies, we use the sequence of ICD disclosures and SOX 404 opinions to conduct within-firm and across-firm testing of the effects of changes in the effectiveness of internal controls over time in ways that minimize competing explanations for observed differences in the quality of accounting accruals. By linking changes in the strength or effectiveness of internal controls with changes in measures of accrual quality, we mitigate concerns about self-selection, correlated omitted variables, and endogeneity that cloud the interpretation of results from studies that rely solely on cross-sectional tests, and we provide stronger tests of causal linkages between internal control weaknesses and the quality of external accounting numbers.

The remainder of our paper is organized as follows. Section II provides institutional background and provides examples of how internal control weaknesses are likely to introduce noise into accruals. Section III describes the accrual quality measures used in our analysis, summarizes the determinants of accrual quality, and sets forth our predictions on the effects of internal control weaknesses and remediation on accrual quality. Section IV describes our sample and provides descriptive statistics. Section V presents our empirical findings and Section VI concludes.

II. INSTITUTIONAL BACKGROUND AND EXAMPLES OF CONTROL WEAKNESSES

Auditing Standards No. 2 (AS No. 2, PCAOB 2004, para. 7) defines internal control over financial reporting (ICFR) as:

> a process designed by ... the company's principal executive and principal financial officers ... and effected by the company's board of directors, management, and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles.

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[3] Indeed, Doyle et al. (2007, 30), recognize this limitation and state: "[O]ur ability to infer causality between internal control problems and accrual quality is limited."

An ICD exists "when the design or operation of a control does not allow management or its employees, in the normal course of performing their assigned functions, to prevent or detect misstatements on a timely basis (AS No. 2, para. 8). Thus, ICFR is focused on timely prevention and detection of financial misstatements, whether unintentional or intentional.[4]

Internal Control—Integrated Framework (The Framework), the external standard or criteria for evaluating ICFR quality (corresponding to GAAP for financial statements), suggests five components or elements of internal control: the control environment, risk assessments, control activities, information and communication, and monitoring (Committee of Sponsoring Organizations of the Treadway Commission [COSO] 1992).[5] A high-quality control environment establishes the importance of internal control throughout the firm. Within such an environment, potential causes of financial misstatements are assessed as to risk and control activities are designed and put in place to mitigate important risks, and exceptions that arise are communicated to parties who can take corrective actions. Finally, the entire internal control process is monitored for exceptions by management and the internal audit function.

ICDs can affect the noise and the magnitude of abnormal accruals in financial statements in two principal ways. One way is through random, *unintentional* misstatements due to the lack of adequate policies, training, or diligence by company employees. Examples are: inventory counting and pricing errors that misreport inventory on hand and related cost of sales, omission of items such as failure to record credit purchases, variation in revenue recording due to lack of specific policies (or employee discretion) for revenue recognition, expensing amounts that should be capitalized and *vice versa*, inadequate basis for accounting estimates such as the allowance of inventory obsolescence, and unreliable procedures for "rolling up" amounts from segments and subsidiaries. These random misstatements can lead to increases or decreases in accruals and resulting net income.

A second way that ICDs can adversely affect the quality of accruals is through *intentional* misrepresentations or omissions by employees or by management. These non-random misstatements typically overstate earnings for the current period, but "big bath" write-offs or cookie jar reserves result in opportunistic understatement of current earnings as well. For example, management's exercise of discretion in accounting choices allows financial misrepresentation through manipulation of accruals for recording important accounting estimates such as warranty liabilities, reserves for sales returns, and allowance for uncollectible receivables. Furthermore, employee fraud is made possible by inadequate segregation of internal control duties. Weak internal control in the form of inadequate segregation of duties can allow the misappropriation of assets and alteration of recorded amounts by an employee that is not detected because the company has inadequate staff for monitoring, or lack of action by top management because of a lax control environment. In addition, misstatements can be introduced into the financial reporting process through "selective oversights or omissions" in accumulating segment and subsidiary information for consolidated reports, as well as through management emphasizing earnings targets in instructions to employees.

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[4] There are inherent limitations in ICFR as noted in AS No. 2, para. 16. These limitations are due to lapses in human judgment, compliance, and diligence, plus collusion and improper management override of ICFR. While these inherent limitations cannot be eliminated, AS No. 2 asserts that it is possible to design into the ICFR process safeguards that will reduce the risk that they will arise.

[5] The control environment and monitoring may be useful in protecting against manipulation of records as a response to management-prescribed targets based on financial performance.

Overall, better internal control leads to more reliable recorded amounts useful in conducting daily activities such as production, sales, and management of inventory, as well as reducing unintentional and intentional misstatements in external financial statements. Conversely, weak internal control introduces noise and/or bias into accruals that adversely affect the quality of both internal and externally reported accounting numbers.

Prior to the passage of the SOX in July 2002, the Foreign Corrupt Practices Act of 1977 required public company management to maintain books and records that would protect corporate assets and facilitate GAAP-based financial reporting, but did not require management to evaluate or certify the effectiveness of internal control (U.S. Congress 1977). Similarly, prior to SOX, auditing standards required the independent auditor to obtain an understanding of ICFR sufficient to properly plan the substantive financial statement audit, but did not require the auditor to evaluate *per se* the design or operating effectiveness of ICFR.[6] SOX changed the required public disclosure, audit, and audit reporting with respect to internal controls in two steps.

Section 302 of SOX, effective August 29, 2002 (SEC 2002), mandates that a firm's CEO and CFO certify in periodic SEC filings that the signing officers have "evaluated ... and have presented in the report their conclusions about the effectiveness of their internal controls based on their evaluation" (302 (a) (4) (C) and (D)). Importantly, neither SOX 302 nor SEC interpretations describe procedures for evaluating controls and do not require independent audits of ICFR. However, in conducting the financial statement audit, the auditor might become aware of internal control problems and require that management acknowledge any known material weakness in its SOX 302 certification.[7] Management certifications and ICD disclosures under SOX 302 began appearing in 2003.

Section 404 of SOX and SEC regulations require that annual reports filed with the SEC contain management's assessment of the effectiveness of internal control over financial reporting as of the fiscal year-end and require that this assessment be audited by the auditor of its financial statements. AS No. 2 (effective for larger firms for fiscal years ending on or after November 15, 2004) provides guidance for the independent audit to support the auditor's opinion on management's report and adds a requirement that the auditor express a separate opinion about internal control effectiveness based on their own review of the firm's internal controls.

In the empirical work to follow, we use management disclosures of ICDs made under SOX 302 or 404 along with auditors' SOX 404 opinions on the effectiveness of internal controls as signals of different levels of internal control effectiveness and test for differences in accrual quality across- and within-firms over time. Specifically, we posit that both intentional and unintentional misstatements are likely to be introduced into accruals measurements when internal controls are weak and that the quality of accruals is diminished when firms have weak internal controls. In addition, we expect that when previously disclosed ICDs are remediated, as evidenced by firms receiving an unqualified SOX 404 audit opinion, accrual quality will improve. Conversely, we posit that firms that receive an adverse SOX 404 opinion after receiving an unqualified SOX 404 opinion in the prior year will exhibit a decrease in accrual quality.

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[6] The Foreign Corrupt Practices Act of 1977 did require external auditors to report to the board of directors any material weaknesses in the firm's internal control over financial reporting noted during conduct of the annual financial statement audit.

[7] In particular, AS No. 2, which became effective for accelerated filers for fiscal years ending on or after November 15, 2004, requires the auditor to "perform limited procedures quarterly" to determine whether material changes in internal control have occurred that should be disclosed in 302 certifications (paras. 202–203).

III. ACCRUAL QUALITY

easures of Accrual Quality

We use three measures to capture accrual quality: (1) the degree to which accruals fail map into past, current, or future cash flows (*WCA_NOISE*); (2) absolute and signed bnormal total accruals (*AB_ACC*); and (3) absolute and signed abnormal working capal accruals (*AB_WCACC*). Note that *WCA_NOISE* and the absolute *AB_ACC* and *B_WCACC* measures are inversely related to accrual quality. Thus, explanatory variables ith a predicted positive relation with these measures imply lower accrual quality.

The *WCA_NOISE* measure is based on the standard deviation of the residual estimated om the following regression that controls for conditional conservatism (Dechow and ichev 2002; Ball and Shivakumar 2006):[8]

$$\begin{aligned} WCA_t = {} & \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 ABNRET_t \\ & + \beta_5 DABNRET_t + \beta_6 DABNRET_t{*}ABNRET_t + \varepsilon \end{aligned} \quad (1)$$

here *WCA* is net income before extraordinary items (Compustat #123) plus depreciation nd amortization (Compustat #125) minus cash flows from operations (Compustat #308) caled by average total assets (Compustat #6), *CFO* is cash flow from operations scaled by verage total assets, *ABNRET* is the buy and hold return over the fiscal year less the equal eighted market return over the fiscal year (taken from CRSP), and *DABNRET* is equal to if *ABNRET* is less than 0, and 0 otherwise. Note that this specification allows working apital accruals to be different depending on whether the economic climate of the firm is egative or positive, consistent with asymmetric loss versus gain recognition under conervative accounting. We estimate Equation (1) by three-, two-, or one-digit SIC codes onditional on having at least 20 firms in each SIC group. In addition, following Ball and hivakumar (2006) we require at least five observations in the industry group to have egative *ABNRET* values. *WCA_NOISE* is the standard deviation of the firm-specific residal from the prior three to five years, where higher values indicate greater accrual noise, e., lower accrual quality.

We begin estimating *AB_ACC* using the following OLS regression:

$$\begin{aligned} TotalAccruals = {} & \alpha_0 + \alpha_1(1/lag1asset) + \alpha_2(\Delta REV - \Delta AR) + \alpha_3 PPE \\ & + \alpha_4 ABNRET + \alpha_5 DABNRET + \alpha_6 DABNRET{*}ABNRET + \varepsilon \end{aligned} \quad (2)$$

here *TotalAccruals* is net income before extraordinary items minus *CFO*, ΔREV is sales Compustat #12) in year t less sales in year $t - 1$, ΔAR is accounts receivable (Compustat 2) in year t less accounts receivable in year $t - 1$, *PPE* is net property, plant, and equipent (Compustat #8), and all other variables are as previously defined. All accounting ariables are scaled by beginning of fiscal year total assets, *lag1asset*. As in Equation (1), e include *ABNRET* and *DABNRET* to control for conditional conservatism when estiating abnormal total accruals. We estimate Equation (2) by three-, two-, or one-digit IC codes conditional on having at least 20 firms in each SIC group. Similar to

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Following Ball and Shivakumar (2006), we add *ABNRET* and *DABNRET* to our three accrual quality models to control for the potential effects of conservatism on the accrual quality metrics. When modeling accrual quality without these two control variables, our results, are qualitatively similar to those reported and discussed later in this study.

estimating Equation (1), we require at least five observations in the industry group to have negative *ABNRET* values. We use the parameter estimates from Equation (2) to calculate expected total accruals as follows:

$$\begin{aligned} Expected\_Total\_Accruals = {} & \hat{\alpha}_0 + \hat{\alpha}_1(1/lag1asset) + \hat{\alpha}_2(\Delta Rev - \Delta AR) \\ & + \hat{\alpha}_3(PPE) + \hat{\alpha}_4 ABNRET + \hat{\alpha}_5 DABNRET \\ & + \hat{\alpha}_6 DABNRET{*}ABNRET. \end{aligned} \tag{3}$$

A firm's unadjusted abnormal total accruals is set equal to the difference between *TotalAccruals* and *Expected_Total_Accruals*. The last step is to performance-adjust abnormal accruals (Kasznik 1999; Kothari et al. 2005). We rank firms within each industry group into ten groups based on their prior year's return-on-assets (ROA). *AB_ACC* is the difference between the sample firm's "unadjusted abnormal accruals" and the median abnormal accruals for firms in the same industry ROA decile, where the median ROA value excludes the particular sample firm. We analyze both the absolute value and signed values of *AB_ACC*.

Our estimation of abnormal working capital accruals, *AB_WCACC*, begins with the following OLS regression estimated by three-, two-, or one-digit SIC codes conditional on having at least 20 firms in each SIC group on Compustat with at least five firms in the SIC group having negative *ABNRET* values:

$$\begin{aligned} WCA = {} & \alpha_0 + \alpha_1(1/lag1asset) + \alpha_2(\Delta REV - \Delta AR) + \alpha_3 ABNRET \\ & + \alpha_4 DABNRET + \alpha_5 DABNRET{*}ABNRET + \varepsilon \end{aligned} \tag{4}$$

where all variables are as previously defined.

We use the parameter estimates from Equation (4) to calculate expected working capital accruals:

$$\begin{aligned} Expected\_WCA = {} & \hat{\alpha}_0 + \hat{\alpha}_1(1/lag1asset) + \hat{\alpha}_2(\Delta Rev - \Delta AR) + \hat{\alpha}_3 ABNRET \\ & + \hat{\alpha}_4 DABNRET + \hat{\alpha}_5 DABNRET{*}ABNRET. \end{aligned} \tag{5}$$

A firm's unadjusted abnormal working capital accruals is set equal to the difference between *WCA* and *Expected_WCA*. Similar to the total accruals quality measure, we performance-adjust abnormal working capital accruals by ranking firms within each industry group into ten groups based on their prior year's ROA. *AB_WCACC* is the difference between the sample firm's unadjusted abnormal working capital accruals and the median abnormal working capital accruals for firms in the same industry ROA decile, where the median ROA value excludes the particular sample firm. We analyze both the absolute value and signed values of *AB_WCACC*.

The two abnormal accrual measures are benchmarked against the average industry relation between accruals and changes in sales adjusted for changes in receivables. These two measures differ by noncurrent accruals related to property, plant, and equipment (e.g., depreciation, amortization, and asset write-offs). The accrual noise measure captures the degree to which working capital accruals fail to map into past, current and future cash flows once again benchmarked against industry norms. While related, the two abnormal accrual measures and the accrual noise measure capture the effects of intentional and unintentional errors due to weak controls that are distinctly different as evidenced by the fact at the correlations between the absolute and signed abnormal accrual measures and the crual noise measure are on the order of .24 or less.

Note that the *WCA_NOISE* and the absolute value of *AB_ACC* and *AB_WCACC* mea-res of accrual quality abstract from the sign of accruals because weak internal controls ive rise to unintentional errors as well as intentional misstatements that can introduce both come increasing and income decreasing errors into accruals measurements. Using signed alues of abnormal accruals potentially allows these offsetting errors to go undetected when veraging across a large number of firms.[9] Consequently, we expect ICD firms to have rger absolute value of abnormal total accruals, and larger abnormal working capital ac-uals relative to non-ICD firms, i.e., we predict a positive relation between the absolute alue of *AB_ACC* and *AB_WCACC* and the presence of an ICD.

It could be the case, however, that weak internal control facilitates managers taking tions to purposefully misreport or omit information from the accounting system in order meet their financial reporting objectives. In fact, the passing of SOX in 2002 and the andate of internal control audits was primarily driven by the extreme market failures of nron and WorldCom, two firms for which senior management was charged with fraudulent porting after purposefully overstating earnings (e.g., see Taub 2004). If weak internal ontrol results in more intentional misrepresentations and irregularities by management that verstate earnings, then we would expect firms with weak internal controls to exhibit larger ositive or smaller negative abnormal accruals relative to firms with strong internal control. , on the other hand, unintentional errors that introduce noise but not bias into accruals e the dominant result of weak internal controls, then we would expect to find larger ositive and larger negative abnormal accruals for ICD firms relative to non-ICD firms. hus, we also present our accruals quality tests by partitioning sample firms by the sign of eir abnormal accruals to provide evidence on whether unintentional errors or intentional isstatements dominate our ICD sample.

Regardless of whether internal control weaknesses lead to unintentional errors or in-ntional misstatements, we expect ICD firms to have a weaker mapping of accruals to cash ows as poor estimates or lack of control over accrual adjustments result in accruals that e never realized as cash inflows or cash outflows (i.e., the accruals mapping to cash flows distorted). Thus, we predict a positive relation between *WCA_NOISE* and the presence f an ICD.

With respect to intertemporal changes in accrual quality, we expect accrual quality to nprove upon remediation of internal control deficiencies as evidenced by the firm receiving clean SOX 404 internal control audit opinion. That is, we expect the absolute value of normal accruals to become smaller, and the positive and negative abnormal accruals to ove closer to zero when ICDs are remediated. Moreover, when firms' internal controls eteriorate as evidenced by receiving an unqualified SOX 404 opinion in 2004 and an

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The *average* error or distortion that is introduced into firms' accruals as a result of weak internal controls will approach zero as the number of firms in the ICD sample, becomes large. The law of large numbers (diversification effect) will not necessarily operate *within firms*, however, because the number of different types of internal control weaknesses within a given firm is often three or less. Even though a given type of control weakness may affect many transactions, its effect on earnings is likely to be in a common direction (e.g., failure to have proper year-end cut-offs for revenue recognition that allows the firm to record sales from next period in the current period or capitalizing costs that should be expensed). Thus, at the firm level, the number and types of control weaknesses are what determines whether the errors are likely to offset one another. With the number of different types of control weaknesses of three or less, the average errors due to weak internal controls are less likely to cancel out at the (single) firm level. Thus, firms' abnormal accruals, which are measured relative to industry norms, are likely to be larger in magnitude, both positive and negative, when internal controls are weak.

adverse SOX 404 opinion in 2005, we expect the absolute value of abnormal accruals to increase.

Determinants of Accrual Quality

Conceptually, we model accrual quality as a function of (1) whether a firm reports an ICD weakness; (2) firms' business fundamentals and operating characteristics; (3) investment in internal controls; (4) GAAP accounting choices; (5) accounting conservatism; and (6) auditor quality.

Prior research documents a number of firm-specific operating characteristics that affect firms' accrual quality (Becker et al. 1998; Dechow and Dichev 2002; Dechow et al. 1995; Francis et al. 2004; Francis et al. 1999; Kothari et al. 2005). Therefore, it is important to control for the innate firm characteristics outlined below in testing for the effects of internal control weaknesses on accrual quality.

Business Fundamentals and Operating Characteristics

Firms with more complex operations are posited to have noisier accruals or larger abnormal accruals due to measurement problems associated with transfer pricing, elimination of inter-segment sales, and foreign currency translation adjustments. At the same time, firms with more complex operations often have more diversified operations that may result in higher accruals quality due to improvements in accrual estimations resulting from less volatile operations. We use the number of operating segments (*SEGMENTS*) and whether the firm has foreign sales (*FOREIGN_SALES*) to capture these effects.

Rapidly growing firms are also likely to have noisier accruals caused by absorption-costing distortions to income when inventory build-ups occur in anticipation of future sales growth. We use the decile rank value of sales growth (*GROWTH*) and inventory investments as a percentage of total assets (*INVENTORY*) as proxies for these effects on accrual quality. Firms involved in mergers and acquisitions (*M&A*) or restructurings (*RESTRUCTURE*) are likely to have noisier and larger abnormal accruals due to the accounting for purchased in-process R&D, goodwill accounting, and asset impairment charges that frequently accompany restructurings and M&A activity. The volatility of firms' operations is systematically related to the propensity to make estimation errors in accruals (Dechow and Dichev 2002). We include the standard deviation of operating cash flows (*STDCFO*) and the standard deviation of sales (*STDSALES*) to proxy for the effects of the volatility of operations on accrual quality.

The last set of variables used to control for business fundamentals pertain to a firm's asset structure, where differences in the measurement and recognition of intangible and tangible assets are posited to affect the quality of accruals (Francis et al. 2005). The level of intangible off-balance sheet assets (*INT_INTENSITY*), the lack of intangible assets (*NO_INT*), and magnitude of property, plant, and equipment (*CAP_INTENSITY*) are used to capture differences in firms' asset structure that require accrual adjustments at fiscal year-end, the quality of which affects the reliability of firms' financial information.

Investment in Internal Controls

Dechow and Dichev (2002) posit that larger firms have more stable and predictable operations and, therefore, fewer and smaller accrual estimation errors. They also posit that the greater the frequency of reporting negative earnings, the lower the accrual quality because losses are indicative of severe negative shocks in a firm's operating environment. Accruals made in response to such shocks are likely to involve substantial estimation error (e.g., restructuring charges). Moreover, prior research (Dechow et al. 1995; DeAngelo et al. 1994; Kothari et al. 2005; McNichols 2000) demonstrates that firms facing financial distress are likely to report larger absolute abnormal accruals. We use firm size as measured by the value of total assets (*SIZE*),[10] the percentage of the last three years that a firm reports losses (*%LOSS*), and financial distress as measured by the ranked value of the Altman (1968) Z-score (*ZSCORE*) to control for these effects on accrual quality.

GAAP Accounting Choices

A myriad of accounting choices, in addition to the accounting for transactions noted above, are likely to impact accrual quality. Given the difficulty of identifying accounting choices, we assume that major GAAP accounting choices are common within an industry, and we control for this effect by estimating abnormal accruals within industry classification (see details above). Therefore, abnormal accruals for both ICD and control firms are adjusted for common industry accounting choices.

Accounting Conservatism

Ball and Shivakumar (2006) argue that accounting conservatism, which results in more timely recognition of losses than gains, increases the variance of earnings (accruals) conditional on the variance of periodic operating cash flows. They predict and find a positive relation between measures of accrual volatility and measures of economic loss after controlling for variation in cash flows. Expensing of R&D and advertising (two conservative accounting treatments) can distort current accrual accounting income as a measure of operating performance. The increased variance and bias in accrual accounting earnings relative to operating cash flows caused by conservative accounting implies a positive relation between accounting conservatism and our accrual quality proxies. Alternatively, conservative accounting may improve accrual quality due to the limitations conservative accounting places on the type of information captured by the financial statements. Conservative accounting results in accounting capturing only the value of separable net assets (Roychowdhury and Watts 2007). Conservative accounting does not recognize unverifiable increases in separable net assets or rents, which are by definition less verifiable and more difficult to estimate. By requiring that only verifiable information be recorded and reported in the financial statements, conservative accounting may improve accrual quality. We use the book-to-market ratio (*BM*) and the presence of an asset impairment or write-down (*WRITEOFF*) to proxy for accounting conservatism, where lower *BM* values and *WRITEOFF*s indicate more conservative accounting (Givoly and Hayn 2000).[11]

Auditor Quality

Prior research suggests audit market leaders serve different clienteles (Craswell et al. 1995; Francis and Wilson 1988), and that the quality of financial information differs between large audit firm clients and small audit firm clients (Becker et al. 1998; Francis et al. 1999; Ashbaugh et al. 2003). We add *AUDITOR* to our accruals model, where *AUDITOR* is equal to 1 if the firm contracts with one of the six largest audit firms, and 0 otherwise.[12]

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[10] We transform total assets to correct for skewness by taking the natural log.

[11] Arguably, large asset write-offs are consistent with both decreases and increases in accrual quality. To the extent that asset write-offs arise from "big-bath" opportunistic managerial behavior designed to artificially inflate future earnings such actions decrease accrual quality. On the other hand, asset write-offs that are dictated by the asset impairment rules of SFAS No. 121 are likely consistent with good internal controls that identify asset impairments on a timely basis and follow well-specified GAAP procedures for estimating and recording those impairments. Accordingly, such write-offs may be viewed as increasing accrual quality. Regardless of whether asset write-offs enhance or detract from accrual quality, the important point is that we control for the impact of asset write-offs in our subsequent tests of the effects of weak internal controls on accrual quality.

The definitions and measurement of the control variables introduced in this section are provided in the Appendix. The predicted relations between control variables and the alternative measures of accrual quality are detailed in the tables that present the results of our empirical tests.

IV. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

We require firms to have at least one SOX 404 opinion to be in our sample, i.e., our sample is comprised of accelerated filers. Depending on a firm's fiscal year-end, its first SOX 404 opinion can fall in either fiscal year 2004 or 2005.[13] We collect SOX 302 management disclosures of ICDs from *Compliance Week* and Glass, Lewis & Co., LLC and SOX 404 audit opinions from *Audit Analytics* to identify firms with weak and strong internal controls.[14] The internal control disclosures span firms' 2003, 2004, and 2005 fiscal reporting periods. We include all types of internal control deficiencies—material weaknesses, significant deficiencies and control deficiencies—because the audit standards defining the severity of internal control problems did not exist over much of the time these disclosures were made, making the distinctions between the types of ICDs problematic (see Ashbaugh-Skaife et al. 2007). By including SOX 302 management disclosures and subsequent SOX 404 audit opinions in our sample, we are able to structure both cross-sectional and within-firm intertemporal tests of changes in the status of internal controls that allow stronger inferences about the effects of internal control weaknesses on accrual quality.

Table 1 reports the break down of the ICD and control samples across 2003, 2004, and 2005 fiscal years. Firms are assigned to the ICD sample in a particular year if management disclosed ICDs under SOX 302 or SOX 404 reporting either in the prior, current, or subsequent year and the firm did not receive an unqualified SOX 404 audit opinion in the current fiscal year. This coding reflects the fact that prior to the effective date of SOX 404 (November 15, 2004), management disclosure of ICDs was largely voluntary. Therefore, internal control weaknesses that likely existed in 2003 or 2004 may not have been disclosed until a subsequent year.[15] Our coding of ICD firms also assumes that the control problems that firms disclosed in subsequent years existed over an extended period of time prior to the first disclosure, which is consistent with finding in Doyle et al. (2007).

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[12] The largest six audit firms include PricewaterhouseCoopers (PWC), Deloitte & Touche, Ernst & Young, KPMG, Grant Thornton, and BDO Seidman.

[13] SOX 404 became effective for accelerated filer firms (firms with market capitalization greater than $75 million) for fiscal years ending on or after November 15, 2004. Thus, an accelerated-filer firm with a fiscal year ending on or after November 15, 2004 filed its auditor's first SOX 404 opinion in its 2004 fiscal year, while a firm with a fiscal year ending from June 1 through November 14, 2004 was not required to file its first SOX 404 audit opinion until its 2005 fiscal year. For firms with fiscal year-ends of January–May, the Compustat data field "YEARA" value does not align with firms' fiscal year-ends. For example, Compustat's "YEARA" value of 2004 encompasses June 1, 2004 to May 31, 2005 fiscal year-ends. Thus, we must align firms' SOX 404 reports with the respective Compustat 2004 and 2005 data.

[14] *Compliance Week* is a weekly electronic newsletter published by Boston's Financial Media Holdings Group and Glass, Lewis & Co., LLC is an investment advisory firm.

[15] Further evidence that management exercised some discretion in disclosing ICDs during the pre-Section 404 regime is provided by a Glass, Lewis & Company (2005) report that 87 percent of firms disclosing ICDs in the first three months of 2005 certified their controls as effective under SOX 302 in the previous quarter. A large percentage of the ICD disclosures made early in the SOX 404 regime related to systemic control problems of long standing (e.g., inadequate recording of inventory or improper year-end role up procedures) suggesting that managers had either not yet detected ICDs or did not feel compelled to disclose these deficiencies during the SOX 302 regime.

TABLE 1
Internal Control Deficiency (ICD) and Control Sample Firms by Fiscal Year

	2003	2004	2005	Total
ICD Firms				
Total observations before Compustat data requirements	638	502	363	1,503
Less observations missing necessary Compustat data for cross-sectional empirical tests	−51	−91	−80	−222
Total ICD Observations	587	411	283	1,281
Control Firms				
No SOX 302 ICD disclosures and an unqualified 2004 SOX 404 opinion	1,815	1,815		3,630
No SOX 302 ICD disclosures in 2003 or 2004 and an unqualified 2005 SOX 404 opinion	417	417	417	1,251
SOX 302 ICD disclosures in 2003 and an unqualified 2004 SOX 404 opinion		136		136
Adverse 2004 SOX 404 opinion and an unqualified 2005 SOX 404 opinion			235	235
SOX 302 ICD disclosures in 2003, no 2004 SOX 404 opinion and an unqualified 2005 SOX 404 opinion			53	53
No 2005 SOX 404 opinion by the sample cut-off date and an unqualified 2004 SOX 404 opinion			50	50
No SOX 302 ICD disclosures and unqualified 2004 and 2005 SOX 404 opinions			1,680	1,680
Total observations before Compustat data requirements	2,232	2,368	2,435	7,035
Less observations missing necessary Compustat data for cross-sectional empirical tests	−203	−225	−110	−538
Total Control Observations	2,029	2,143	2,325	6,497

The sample is comprised of all firms filing at least one SOX 404 audit opinion in 2004 or 2005. When firms are reclassified from the ICD sample to the control sample or from the control sample to the ICD sample this reclassification is based on their most recent SOX 404 opinion.

Firms migrate out of the ICD sample and into the control sample in the year that they receive an unqualified SOX 404 opinion (either 2004 or 2005), and they migrate into the ICD sample out of the control sample if they receive an adverse SOX 404 opinion in 2005 after receiving an unqualified SOX 404 opinion in 2004. Details on the number of firms that migrate between samples are provided in the control sample section of this table. As shown, the bulk of the firms that comprise the control sample in a given fiscal year are firms that disclosed no ICDs under SOX 302 and received unqualified SOX 404 opinions for FY 2004, 2005, or both years.

After deleting firms with missing Compustat data needed for other control variables in our cross sectional regressions, the final ICD (control) samples total 587 (2,029), 411 (2,143), and 283 (2,325) firms in 2003, 2004, and 2005, respectively. In summary, our pooled cross-sectional analysis uses 1,281 firm-year observations in the ICD sample and 6,497 firm-year observations in the control (non-ICD) sample.

Table 2 reports the descriptive statistics, where Panel A displays the distributional properties of the control variables by ICD and control samples. The descriptive statistics (means) indicate that ICD firms have more business segments, are more likely to have foreign sales, have a slower growth in sales, carry slightly higher inventory levels, more

TABLE 2
Descriptive Statistics

Panel A: Distributional Properties of Variables used in Empirical Tests[a]

ICD Sample (n = 1,281 firm-year observations pooled over 2003, 2004, and 2005)

	Mean	Median	Std. Dev.	Q1	Q3
SEGMENTS	**3.506**	1.000	3.874	1.000	5.000
FOREIGN_SALES	**0.598**	**1.000**	0.490	0.000	1.000
GROWTH	**0.205**	**0.084**	0.539	−0.001	0.222
INVENTORY	**0.108**	**0.062**	0.130	0.004	0.163
M&A	0.347	0.000	0.476	0.000	1.000
RESTRUCTURE	**0.505**	**1.000**	0.500	0.000	1.000
STD_CFO	**0.089**	**0.059**	0.111	0.034	0.104
STD_SALES	**0.203**	**0.146**	0.204	0.074	0.268
INT_INTENSITY	0.199	0.026	1.036	0.000	0.133
NO_INT	0.305	0.000	0.461	0.000	1.000
CAP_INTENSITY	0.251	**0.168**	0.230	0.065	0.373
SIZE	**6.084**	**5.891**	1.613	5.052	7.012
%LOSS	**0.414**	**0.400**	0.363	0.000	0.800
ZSCORE	**4.135**	**4.000**	2.874	2.000	7.000
BM	**0.476**	**0.425**	0.362	0.257	0.664
AUDITOR	**0.950**	**1.000**	0.218	1.000	1.000
WRITEOFF	**0.247**	**0.000**	0.431	0.000	0.000

(continued on next page)

TABLE 2 (continued)

Control Sample (n = 6,497 firm-year observations pooled over 2003, 2004, and 2005)

SEGMENTS	**3.269**	1.000	3.645	1.000	4.000
FOREIGN_SALES	**0.566**	**1.000**	0.496	0.000	1.000
GROWTH	**0.243**	**0.104**	0.664	0.027	0.227
INVENTORY	**0.095**	**0.052**	0.118	0.004	0.144
M&A	0.336	0.000	0.472	0.000	1.000
RESTRUCTURE	**0.434**	**0.000**	0.496	0.000	1.000
STD_CFO	**0.075**	**0.050**	0.089	0.028	0.087
STD_SALES	**0.172**	**0.120**	0.175	0.063	0.219
INT_INTENSITY	0.391	0.022	1.673	0.000	0.113
NO_INT	0.317	0.000	0.465	0.000	1.000
CAP_INTENSITY	0.263	**0.182**	0.232	0.079	0.391
SIZE	**6.557**	**6.433**	1.776	5.275	7.707
%LOSS	**0.304**	**0.200**	0.365	0.000	0.600
ZSCORE	**4.568**	**5.000**	2.867	2.000	7.000
BM	**0.418**	**0.379**	0.285	0.233	0.570
AUDITOR	**0.965**	**1.000**	0.185	1.000	1.000
WRITEOFF	**0.201**	**0.000**	0.401	0.000	0.000

(*continued on next page*)

TABLE 2 (continued)

Panel B: Pearson Correlations (top) and Spearman Correlations (bottom)[b]

		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
ICD	1		**0.06**	**0.06**	**0.09**	**0.02**	**0.02**	**−0.02**	**0.04**	0.01	**0.05**	**0.06**	**0.06**	**−0.05**	−0.01	−0.02	**−0.10**	**0.11**	**−0.06**	**0.07**	**−0.03**	**0.04**
AB_ACC	2	**0.07**		**0.90**	**0.24**	**−0.07**	**−0.07**	**0.15**	0.00	−0.01	**−0.03**	**0.31**	**0.15**	**0.12**	**−0.08**	**−0.16**	**−0.26**	**0.26**	**−0.10**	**−0.14**	**−0.08**	**0.03**
AB_WCACC	3	**0.07**	**0.77**		**0.25**	**−0.07**	**−0.06**	**0.15**	**0.03**	−0.01	**−0.04**	**0.31**	**0.16**	**0.11**	**−0.08**	**−0.17**	**−0.25**	**0.24**	**−0.08**	**−0.14**	**−0.09**	0.02
WCA_NOISE	4	**0.09**	**0.24**	**0.24**		**−0.14**	**0.04**	**0.12**	**0.03**	0.02	0.01	**0.44**	**0.29**	**0.13**	**−0.20**	**−0.38**	**−0.41**	**0.31**	**−0.04**	**−0.14**	**−0.13**	**−0.05**
SEGMENTS	5	0.02	**−0.04**	**−0.05**	**−0.14**		**−0.08**	**−0.08**	0.00	**0.03**	**0.04**	**−0.13**	**−0.04**	**−0.08**	**0.11**	**0.09**	**0.19**	**−0.15**	**−0.04**	**0.09**	**0.02**	**0.06**
FOREIGN_SALES	6	**0.02**	**−0.05**	**−0.04**	**0.07**	**−0.27**		**−0.10**	**0.03**	**0.12**	**0.27**	**−0.08**	−0.01	**−0.14**	**−0.21**	**−0.21**	**0.16**	−0.02	**0.05**	−0.01	**0.05**	**0.06**
GROWTH	7	**−0.04**	**0.10**	**0.11**	**0.07**	**−0.07**	**−0.08**		**−0.09**	**0.04**	**−0.14**	**0.34**	**0.10**	**0.22**	**−0.04**	**−0.04**	**−0.16**	**0.22**	**−0.10**	**−0.10**	**−0.07**	**−0.05**
INVENTORY	8	**0.03**	−0.02	0.01	**0.04**	0.02	**0.15**	**−0.05**		**−0.07**	−0.01	**−0.07**	**0.07**	**−0.14**	**−0.12**	**−0.12**	0.01	**−0.23**	**0.37**	**0.17**	0.01	**−0.04**
M&A	9	0.01	0.00	0.00	**0.04**	0.00	**0.12**	**0.17**	**−0.05**		**0.09**	**−0.06**	**0.06**	**−0.09**	**−0.04**	**−0.15**	**0.10**	**−0.07**	−0.01	**0.05**	**0.05**	**0.03**
RESTRUCTURE	10	**0.05**	−0.02	**−0.03**	**0.04**	**−0.03**	**0.27**	**−0.26**	**0.06**	**0.09**		**−0.08**	0.01	**−0.05**	**−0.16**	**−0.16**	**0.18**	**0.13**	**−0.11**	**0.05**	**0.09**	**0.16**
STD_CFO	11	**0.08**	**0.32**	**0.33**	**0.51**	**−0.13**	**−0.05**	**0.18**	**−0.08**	**−0.05**	**−0.05**		**0.29**	**0.27**	**−0.15**	**−0.25**	**−0.44**	**0.41**	**−0.11**	**−0.18**	**−0.16**	**−0.05**
STD_SALES	12	**0.07**	**0.15**	**0.18**	**0.34**	**−0.03**	**0.04**	**0.11**	**0.15**	**0.06**	**0.04**	**0.41**		**−0.08**	−0.01	**−0.17**	**−0.20**	**0.11**	**0.15**	**−0.03**	**−0.07**	−0.02
INT_INTENSITY	13	0.02	**0.13**	**0.13**	**0.34**	**−0.23**	**0.17**	**0.04**	**−0.03**	0.02	**0.14**	**0.35**	**0.05**		**−0.15**	**−0.14**	**−0.25**	**0.36**	**−0.22**	**−0.13**	**−0.02**	**−0.02**
NO_INT	14	−0.01	**−0.08**	**−0.08**	**−0.24**	**0.15**	**−0.21**	0.00	**−0.19**	**−0.04**	**−0.16**	**−0.17**	**−0.06**	**−0.82**		**0.38**	**0.14**	**−0.20**	**−0.04**	**0.16**	**0.02**	−0.02
CAP_INTENSITY	15	**−0.03**	**−0.17**	**−0.18**	**−0.46**	**0.13**	**−0.15**	**−0.06**	**0.07**	**−0.15**	**−0.10**	**−0.36**	**−0.21**	**−0.46**	**0.32**		**0.30**	**−0.25**	**−0.16**	**0.11**	**0.03**	**0.03**
SIZE	16	**−0.10**	**−0.25**	**−0.25**	**−0.45**	**0.12**	**0.15**	**−0.08**	**0.09**	**0.10**	**0.17**	**−0.55**	**−0.24**	**−0.32**	**0.16**	**0.35**		**−0.43**	**−0.04**	**0.10**	**0.22**	**0.11**
%LOSS	17	**0.12**	**0.21**	**0.20**	**0.32**	**−0.12**	0.00	**−0.02**	**−0.27**	**−0.06**	**0.16**	**0.45**	**0.14**	**0.41**	**−0.20**	**−0.29**	**−0.42**		**−0.48**	**−0.13**	**−0.10**	**0.07**
ZSCORE	18	**−0.06**	**−0.03**	−0.01	**0.03**	**−0.03**	**0.05**	**0.06**	**0.37**	−0.01	**−0.11**	**−0.02**	**0.19**	**−0.12**	**−0.04**	**−0.09**	**−0.05**	**−0.45**		**0.10**	**0.03**	**−0.10**
BM	19	**0.06**	**−0.14**	**−0.14**	**−0.16**	**0.11**	0.00	**−0.16**	**0.15**	**0.07**	**0.07**	**−0.24**	**−0.07**	**−0.26**	**0.18**	**0.14**	**0.13**	**−0.13**	**0.10**		**0.04**	**0.05**
AUDITOR	20	**−0.03**	**−0.08**	**−0.07**	**−0.11**	0.01	**0.05**	**−0.06**	0.01	**0.05**	**0.09**	**−0.11**	**−0.03**	**−0.03**	**0.02**	**0.05**	**0.22**	**−0.09**	**0.03**	**0.05**		0.00
WRITEOFF	21	**0.04**	0.02	0.00	**−0.04**	**0.03**	**0.06**	**−0.08**	0.00	**0.03**	**0.16**	**−0.05**	−0.01	0.01	−0.02	**0.06**	**0.10**	**0.08**	**−0.10**	**0.05**	0.00	

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[a] Bold text indicates significant differences between the ICD sample and Control sample at the 0.05 level or better, one-tailed. Differences in means (medians) are assessed using a t-test (Wilcoxon rank sum test).

[b] Bold text indicates significance at the 0.05 level or better two-tailed.

The Pearson correlation between the signed values *AB_ACC* and *WCA_NOISE* is −0.02 and the correlation between the signed values *AB_WCACC* and *WCA_NOISE* is 0.01.

See the Appendix for variable definitions.

often engage in restructurings, and are more likely to have asset write-offs in comparison to control (non-ICD) firms. Table 2 also reveals that ICD firms have more variable cash flows from operations, more variable sales levels, and are smaller and more likely to report losses than control firms. We also observe that ICD firms have higher book-to-market ratios, are more likely to be in financial distress and hire dominant auditors slightly less often than control firms. Overall the statistically significant differences in these firm-specific characteristics between ICD and control firms indicate the importance of controlling for these innate firm characteristics in our cross-sectional tests of accrual quality differences.

Panel B of Table 2 reports the pair-wise correlations, where the upper-right-hand portion displays the Pearson product-moment correlations, and the lower-left-hand portion displays the Spearman rank-order correlations. We discuss the Pearson correlations, but note that the Spearman rank-order correlations are generally consistent with the Pearson results. The ICD indicator variable is positively correlated with all three accrual quality measures. In addition, the ICD indicator variable is significantly negatively correlated with *GROWTH*, *INT_INTENSITY*, *SIZE*, *ZSCORE*, and *AUDITOR* and significantly positively correlated with *SEGMENTS*, *FOREIGN_SALES*, *INVENTORY*, *RESTRUCTURE*, *STD_CFO*, *STD_SALES*, *%LOSS*, *BM*, and *WRITEOFF*. As expected, the three accrual quality measures are also significantly correlated with most of the control variables. We also note the numerous significant positive and negative correlations between the various control variables with the largest being the correlation between *STD_CASH* and *SIZE* at −0.44.[16]

V. RESULTS

Cross-Sectional Tests

Table 3 presents results of univariate tests for differences in accrual quality between ICD and control samples. The mean values of the unsigned *AB_ACC*, *AB_WCACC*, and *WCA_NOISE* for the ICD sample are 0.073, 0.069, and 0.055, respectively. The mean values of the unsigned accrual quality measures for the control sample are significantly smaller at 0.062, 0.058, and 0.049, respectively. We see similar differences in the median values of the unsigned accrual measures between the ICD sample and control sample.

For the ICD sample, the average (median) signed abnormal total accrual is −0.004 (0.000), while the average (median) signed working capital accrual is −0.002 (0.002). None of these values is significantly different from zero or from the values for the control sample. These results suggest that the ICD sample is not dominated by intentional income-increasing misstatements. However, when we split the ICD and control samples by the sign of their abnormal total accruals (*AB_ACC*), we find that ICD firms report significantly larger positive (negative) abnormal total accruals (both mean and median) relative to control firms. We observe similar differences between ICD and control firms for abnormal working capital accruals. The fact that ICD firms report, on average, larger positive and larger negative abnormal accruals relative to control firms is consistent with internal control weaknesses adding noise to accruals through unintentional errors, inadvertent oversights, and accidental misstatements that affect earnings in both directions and culminate in less reliable accruals.

The following empirical model is used to test whether internal control problems affect accrual quality after controlling for firm characteristics that affect the magnitude of abnormal accruals or accrual noise:

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[16] We calculate the variance of inflation factors (VIFs) for each control variable used in the multivariate regressions and find none of them to be above 10 indicating that multicollinearity is not a concern.

TABLE 3
Univariate Tests of Differences in Accrual Quality

	AB_ACC		*AB_WCACC*		*WCA_NOISE*	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
Unsigned						
ICD Sample (n = 1,281)	**0.073**	**0.052**	**0.069**	**0.046**	**0.055**	**0.044**
Control Sample (n = 6,497)	**0.062**	**0.041**	**0.058**	**0.037**	**0.049**	**0.039**
Signed						
ICD Sample (n = 1,281)	−0.004	0.000	−0.002	0.002		
Control Sample (n = 6,497)	−0.005	−0.001	−0.005	−0.003		
Positive						
ICD Sample (n = 637, 661)	**0.071**	**0.053**	**0.065**	**0.046**		
Control Sample (n = 3,201, 3,091)	**0.057**	**0.040**	**0.056**	**0.037**		
Negative						
ICD Sample (n = 644, 620)	**−0.076**	**−0.049**	**−0.073**	**−0.047**		
Control Sample (n = 3,296, 3,406)	**−0.066**	**−0.043**	**−0.059**	**−0.037**		

Bold text indicates significant differences between the ICD Sample and Control Sample at the 0.01 level or better, one-tailed, where larger values represent lower accrual quality. Differences in means (medians) are assessed using a t-test (Wilcoxon rank sum test).
See the Appendix for variable definitions.

$$\begin{aligned} AQM = {} & \beta_0 + \beta_1 ICD + \beta_2 SEGMENTS + \beta_3 FOREIGN\_SALES + \beta_4 GROWTH \\ & + \beta_5 INVENTORY + \beta_6 M\&A + \beta_7 RESTRUCTURE + \beta_8 STD\_CFO \\ & + \beta_9 STD\_SALES + \beta_{10} INT\_INTENSITY + \beta_{11} NO\_INT \\ & + \beta_{12} CAP\_INTENSITY + \beta_{13} SIZE + \beta_{14} \%LOSS + \beta_{15} ZSCORE \\ & + \beta_{16} BM + \beta_{17} AUDITOR + \beta_{18} WRITEOFF + \varepsilon \end{aligned} \qquad (6)$$

where *AQM* is set equal to either *AB_ACC*, *AB_WCACC*, or *WCA_NOISE*, and all other variables are as previously defined.

Panel A of Table 4 reports the Tobit regression results for Equation (6), where *AQM* is set equal to the absolute value of *AB_ACC*, *AB_WCACC*, and *WCA_NOISE*, respectively. Equation (6) is estimated using Tobit regression because the dependent variables are restricted to be positive (Greene 1990, Chap. 21).

For brevity, we collectively discuss the results presented in Panel A of Table 4. The log-likelihood ratios of the three regression results are highly significant indicating that the independent variables, as a whole, explain a significant portion of firms' abnormal accruals or accrual noise. The significantly positive coefficients on *INVENTORY*, *STD_CFO*, and *STD_SALES* indicate, as expected, that firms with greater inventory levels, more volatile cash flows from operations and more volatile sales report lower quality accruals. Furthermore, the significantly positive coefficients, in general, on *GROWTH*, *%LOSS*, *M&A*, and *WRITEOFF* indicate that high-growth firms, firms reporting losses, firms engaging in M&A, and firms that more often book asset write-offs report larger abnormal accruals and greater accrual noise.

The significantly negative coefficient on *FOREIGN_SALES* when estimating the *AB_ACC*, and *AB_WCACC* models and significantly positive coefficient in the *WCA_NOISE* model indicate that firms with foreign sales have smaller abnormal accruals

TABLE 4
Cross-Sectional Analysis of Accrual Quality

$$\begin{aligned} \mathit{AQM} = {} & \beta_0 + \beta_1 \mathit{ICD} + \beta_2 \mathit{SEGMENTS} + \beta_3 \mathit{FOREIGN\_SALES} + \beta_4 \mathit{GROWTH} \\ & + \beta_5 \mathit{INVENTORY} + \beta_6 \mathit{M\&A} + \beta_7 \mathit{RESTRUCTURE} + \beta_8 \mathit{STD\_CFO} \\ & + \beta_9 \mathit{STD\_SALES} + \beta_{10} \mathit{INT\_INTENSITY} + \beta_{11} \mathit{NO\_INT} \\ & + \beta_{12} \mathit{CAP\_INTENSITY} + \beta_{13} \mathit{SIZE} + \beta_{14} \mathit{\%LOSS} + \beta_{15} \mathit{ZSCORE} \\ & + \beta_{16} \mathit{BM} + \beta_{17} \mathit{AUDITOR} + \beta_{18} \mathit{WRITEOFF} + \varepsilon \end{aligned}$$

Panel A: Tobit Regression Results Using *Unsigned* Accrual Quality Measures

	Exp. Sign	*AB_ACC*	*AB_WCACC*	*WCA_NOISE*
Intercept	?	0.094***	0.087***	0.081***
ICD	+	0.006***	0.005***	0.002**
SEGMENTS	?	0.000	0.000	0.000***
FOREIGN_SALES	?	−0.006***	−0.006***	0.002*
GROWTH	+	0.004***	0.005***	0.001*
INVENTORY	+	0.041***	0.051***	0.015***
M&A	+	0.003**	0.003**	−0.001
RESTRUCTURE	+	−0.001	−0.003**	0.001
STD_CFO	+	0.121***	0.118***	0.094***
STD_SALES	+	0.019***	0.023***	0.028***
INT_INTENSITY	+	0.000	−0.001*	−0.001***
NO_INT	−	0.002*	0.002	−0.002**
CAP_INTENSITY	−	−0.018***	−0.020***	−0.036***
SIZE	−	−0.004***	−0.004***	−0.004***
%LOSS	+	0.016***	0.014***	0.002
ZSCORE	−	−0.002***	−0.002***	−0.001***
BM	?	−0.021***	−0.020***	−0.004***
AUDITOR	−	−0.004	−0.005*	−0.002
WRITEOFF	+	0.009***	0.007***	−0.001
Log-Likelihood		10485.66***	10661.34***	9524.81***
n		7,778	7,778	4,527

Panel B: OLS Regression Results Using All *Signed* Abnormal Accruals

	Exp. Sign	*AB_ACC*	*AB_WCACC*
Intercept	?	0.003	0.005
ICD	+/?	0.000	0.000
SEGMENTS	?	0.000	0.000
FOREIGN_SALES	?	0.002	0.002
GROWTH	+	−0.001	−0.003**
INVENTORY	+	0.069***	0.068***
M&A	+	−0.008***	−0.006***
RESTRUCTURE	+	−0.002	−0.002
STD_CFO	+	0.045***	0.040***
STD_SALES	+	0.001	0.007*

(*continued on next page*)

TABLE 4 (continued)

	Exp. Sign	*AB_ACC*	*AB_WCACC*
INT_INTENSITY	+	−0.001	−0.001*
NO_INT	−	0.005***	0.006***
CAP_INTENSITY	−	0.008*	−0.009**
SIZE	−	−0.002***	−0.001**
%LOSS	+	0.001	0.002
ZSCORE	−	0.000	0.000
BM	?	0.017***	0.012***
AUDITOR	−	−0.011***	−0.006*
WRITEOFF	+	−0.017***	−0.015***
Adjusted R^2		0.03	0.03
n		7,778	7,778

Panel C: Tobit Regression Results Using *Positive* Abnormal Accruals

		Positive *AQM*	
	Exp. Sign	*AB_ACC*	*AB_WCACC*
Intercept	?	0.083***	0.077***
ICD	+	0.006***	0.003*
SEGMENTS	?	0.000	0.000
FOREIGN_SALES	?	−0.004**	−0.005**
GROWTH	+	0.003***	0.001
INVENTORY	+	0.059***	0.064***
M&A	+	−0.001	0.000
RESTRUCTURE	+	−0.001	−0.002
STD_CFO	+	0.085***	0.087***
STD_SALES	+	0.015***	0.022***
INT_INTENSITY	+	−0.003***	−0.002***
NO_INT	−	0.004*	0.002
CAP_INTENSITY	−	−0.014***	−0.017***
SIZE	−	−0.005***	−0.004***
%LOSS	+	0.012***	0.011***
ZSCORE	−	−0.001**	−0.001*
BM	?	−0.014***	−0.014***
AUDITOR	−	0.000	0.001
WRITEOFF	+	−0.001	−0.001
Log-Likelihood		5909.67***	5742.35***
n		3,838	3,752

Panel D: Tobit Regression Results Using *Negative* Abnormal Accruals

		Negative *AQM*	
	Exp. Sign	*AB_ACC*	*AB_WCACC*
Intercept	?	−0.103***	−0.095***
ICD	−	−0.004*	−0.007***
SEGMENTS	?	0.000	0.000

(*continued on next page*)

TABLE 4 (continued)

		Negative *AQM*	
	Exp. Sign	***AB_ACC***	***AB_WCACC***
FOREIGN_SALES	?	0.007***	0.005***
GROWTH	−	−0.005***	−0.009***
INVENTORY	−	−0.016*	−0.031***
M&A	−	−0.005**	−0.004**
RESTRUCTURE	−	0.001	0.003*
STD_CFO	−	−0.138***	−0.128***
STD_SALES	−	−0.026***	−0.027***
INT_INTENSITY	−	−0.002***	0.000
NO_INT	+	−0.001	−0.002
CAP_INTENSITY	+	0.017***	0.024***
SIZE	+	0.004***	0.003***
%LOSS	−	−0.017***	−0.016***
ZSCORE	+	0.002***	0.002***
BM	?	0.024***	0.022***
AUDITOR	+	0.012**	0.013**
WRITEOFF	−	−0.015***	−0.012***
Log-Likelihood		5179.14***	5510.58***
n		3,940	4,026

***, **, * Denote significant at the 0.01, 0.05, 0.10 levels, respectively.
See the Appendix for variable definitions.

but more noisy accruals. Conversely, firms with smaller book-to-market (*BM*) ratios have higher abnormal total, higher abnormal working capital accruals, and marginally more noisy accruals suggesting that firms with more conservative accounting have less reliable accruals.

Consistent with expectations, the significantly negative coefficient on *CAP_INTENSITY* indicates that firms with more investment in property, plant, and equipment have more reliable accruals. Contrary to expectations, we find significant negative coefficients on *INT_INTENSITY* in the *AB_WCACC* and *WCA_NOISE* models, suggesting that firms with substantial off-balance sheet intangible assets report higher quality accruals. Likewise, contrary to expectations, we find a significantly negative coefficient on *RESTRUCTURE* in the abnormal working capital accruals regression suggesting firms that engage in restructurings report higher quality accruals. The negative and significant coefficient on *ZSCORE* in all three regressions indicates that financially distressed firms report lower quality accruals (DeAngelo et al. 1994).

Turning to the variable of interest, we find the coefficient on *ICD* is significantly positive in all three regressions after controlling for innate firm characteristics that affect accrual quality. These findings lead us to conclude that firms with internal control problems report lower quality accruals (i.e., larger absolute abnormal total accruals, larger absolute abnormal working capital accruals, and noisier working capital accruals) relative to firms that have effective controls.

Panel B of Table 4 displays results for signed abnormal accruals. If intentional misstatements that result in income-increasing accruals dominate our ICD sample, then we would expect the coefficient on the *ICD* variable to be significantly positive. If, on the other hand, internal control weaknesses result in unintentional errors that introduce both income-increasing and income-decreasing errors that offset across ICD firms, then we would expect the coefficient on the *ICD* variable to be zero. The zero coefficients for the *ICD* variable for both *AB_ACC* and *AB_WCACC* in Panel B are consistent with the latter interpretation.

Panels C and D of Table 4 display the analysis of the relation between internal control weaknesses and accrual quality conditional on the sign of abnormal accruals. If weak internal controls introduce greater volatility into accruals because of unintentional errors, we expect ICD firms to exhibit larger positive and larger negative abnormal accruals relative to control (non-ICD) firms when conditioning on the sign of abnormal accruals. Consistent with this prediction, we find a positive and significant coefficient on *ICD* conditional on abnormal accruals being positive (Panel B) and a significantly negative coefficient on *ICD* conditional on abnormal accruals being negative (Panel C). Ten (nine) of the 17 coefficients in the positive abnormal total (working capital) accruals tests are significant in the predicted direction. One difference in the negative accruals test is that we find a marginally significant and positive coefficient on *AUDITOR*, suggesting that firms that hire a dominant audit firm with brand name recognition to protect report less negative accruals. Overall, the results of the signed accrual tests are consistent with the results for unsigned measures of accrual quality and indicate that firms with ICDs report noisier, less reliable accruals.

Remediation Results

Our second set of analyses examines whether accrual quality improves for ICD firms that remediate their internal control problems. To alleviate possible concern that control weaknesses of lesser severity are more likely to be remediated, our remediation tests are restricted to ICD firms that reported material weaknesses in internal controls (the highest level of severity as per AS No. 2). We estimate the following cross-sectional Tobit model:

$$\begin{aligned} AQM = {} & \beta_0 + \beta_1 WEAKCONTROLS + \beta_2 ICD\_FIXED + \beta_3 SEGMENTS \\ & + \beta_4 FOREIGN\_SALES + \beta_5 GROWTH + \beta_6 INVENTORY + \beta_7 M\&A \\ & + \beta_8 RESTRUCTURE + \beta_9 STD\_CFO + \beta_{10} STD\_SALES \\ & + \beta_{11} INT\_INTENSITY + \beta_{12} NO\_INT + \beta_{13} CAP\_INTENSITY \\ & + \beta_{14} SIZE + \beta_{15} \%LOSS + \beta_{16} ZSCORE + \beta_{17} BM + \beta_{18} AUDITOR \\ & + \beta_{19} WRITEOFF + \varepsilon \end{aligned} \tag{7}$$

where *AQM* is set equal to either *AB_ACC* or *AB_WCACC*; *WEAKCONTROLS* is equal to 1 if the firm disclosed a material weakness under SOX 302 or received an adverse SOX 404 opinion in the current or prior year, and 0 otherwise;[17] and *ICD_FIXED* is equal to 1 if the *WEAKCONTROLS* firm subsequently received an unqualified SOX 404 internal control audit opinion, and 0 otherwise. All other variables are as previously defined.

By construction, *ICD_FIXED* is essentially an interaction term between the *WEAKCONTROLS* dummy and a second dummy that is set equal to 1 if the *WEAKCONTROLS* firm receives an unqualified SOX 404 opinion in the current year and 0 otherwise. Thus, *ICD_FIXED* firms and the firms continuing to report material weaknesses all have *WEAKCONTROLS* values of 1. Those firms that remediate their material weaknesses have *ICD_FIXED* values of 1.

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[17] Note that the *WEAKCONTROLS* coding is *not* the same coding as for ICD firms in Tables 2 through 4, which are firms that reported any kind of control problem (material weakness, significant deficiency, or control deficiency) and did not receive an unqualified SOX 404 opinion in the current year for which the accrual quality measure is being computed.

Note that β_0 reflects the average abnormal accruals of control firms, i.e., firms that did not disclose an ICD that also received an unqualified SOX 404 opinion. Hence, this coefficient reflects the benchmark average accrual quality measure for firms with effective internal controls as confirmed by an outside independent audit. With *WEAKCONTROLS* and *ICD_FIXED* both in the model, the coefficient on *WEAKCONTROLS* (β_1) captures the incremental (relative to non-ICD control firms) average abnormal accruals of firms that previously reported ICDs, but failed to have these problems resolved by the end of the fiscal year when the SOX 404 audits were conducted. Accordingly, for unsigned abnormal accruals measures we expect the coefficient on *WEAKCONTROLS* to be significantly positive, which would be consistent with these firms continuing to report lower quality accruals than non-ICD firms.

The β_2 coefficient on *ICD_FIXED* captures the incremental (relative to *WEAKCONTROLS* firms) average abnormal accruals of *ICD_FIXED* firms. When analyzing unsigned abnormal accruals, we expect a negative coefficient on *ICD_FIXED* as these firms received an unqualified SOX 404 opinion providing independent third-party verification that they resolved their internal control problems, which should result in improvements in accrual quality, i.e., smaller abnormal total accruals and smaller abnormal working capital accruals, relative to firms that continue to have weak internal controls. The sum, $\beta_1 + \beta_2$, measures the difference in abnormal accruals of firms that have remediated their control problems relative to control firms that never reported an ICD and received an unqualified SOX 404 opinion. Thus, we do *not* expect $\beta_1 + \beta_2$ to be significantly different from zero.

Panel A of Table 5 displays the samples used in the remediation of material weakness tests. There are a total of 971 firm-years across our sample period where firms reported material weakess ICDs, of which 313 remediate their internal control problems as signaled by an unqualified SOX 404 opinion.[18]

Panel B of Table 5 reports the results of estimating Equation (7) substituting the absolute value of *AB_ACC* and *AB_WCACC* for *AQM*.[19] In general, the coefficients on the control variables are similar to those in Panel A of Table 4 and are not discussed further. We find that the coefficient on *WEAKCONTROLS* is positive and significant indicating that firms with internal control problems that fail to have those problems remediated report larger abnormal total and working capital accruals relative to non-ICD firms (roughly 0.5 percent of total assets). Moreover, consistent with expectations, the coefficient on *ICD_FIXED* is negative and significant, which indicates that the ICD firms that correct their control problems and receive an unqualified SOX 404 opinion display smaller absolute

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[18] Note that the ICD sample sizes reported in Table 1 for 2004 (411) and 2005 (283) are *smaller* than the sample sizes for *WEAKCONTROLS* reported in Table 5 for 2004 (443) and 2005 (528). This is because firms that end up remediating their material weaknesses are included in the *WEAKCONTROLS* sample count even in the year that they remediate, while these firms are not included in the ICD sample count in Table 1 after their control problems are corrected.

[19] We do not use the *WCA_NOISE* measure in the remediation analysis because it is based on the standard deviation of data points over time aggregated by firm. Because this measure is estimated using data points over time, it does not lend itself to measuring changes from one year to the next. With a rolling five-year window, only one data point used in estimating the standard deviation will change from one year to the next. In contrast, the abnormal accrual measures can be calculated for each firm each year. Thus, these measures lend themselves much better to change analysis for remediation firms.

TABLE 5
Remediation of Material Weaknesses

Panel A: Remediation Samples

	2004	2005	Total
WEAKCONTROLS = 1	443	528	971
WEAKCONTROLS = 0	2,012	1,978	3,990
ICD_FIXED = 1	50	263	313
ICD_FIXED = 0	2,405	2,243	4,648

$$\begin{aligned} AQM = {} & \beta_0 + \beta_1 WEAKCONTROLS + \beta_2 ICD\_FIXED + \beta_3 SEGMENTS \\ & + \beta_4 FOREIGN\_SALES + \beta_5 GROWTH + \beta_6 INVENTORY + \beta_7 M\&A \\ & + \beta_8 RESTRUCTURE + \beta_9 STD\_CFO + \beta_{10} STD\_SALES + \beta_{11} INT\_INTENSITY \\ & + \beta_{12} NO\_INT + \beta_{13} CAP\_INTENSITY + \beta_{14} SIZE + \beta_{15} \%LOSS + \beta_{16} ZSCORE \\ & + \beta_{17} BM + \beta_{18} AUDITOR + \beta_{19} WRITEOFF + \varepsilon \end{aligned}$$

Panel B: Tobit Regression Results Using *Unsigned* Abnormal Accruals Conditional on Firms that Remediate Internal Control Weaknesses

		AQM	
	Exp. Sign	*AB_ACC*	*AB_WCACC*
Intercept	?	0.089***	0.078***
WEAKCONTROLS	+	0.006***	0.005**
ICD_FIXED	−	−0.011***	−0.008**
SEGMENTS	?	0.000	0.000
FOREIGN_SALES	?	−0.008***	−0.006***
GROWTH	+	0.004***	0.004***
INVENTORY	+	0.040***	0.051***
M&A	+	0.005***	0.005***
RESTRUCTURE	+	−0.003*	−0.005***
STD_CFO	+	0.123***	0.121***
STD_SALES	+	0.026***	0.030***
INT_INTENSITY	+	0.000	0.000
NO_INT	−	0.001	0.003
CAP_INTENSITY	−	−0.017***	−0.020***
SIZE	−	−0.004***	−0.003***
%LOSS	+	0.016***	0.017***
ZSCORE	−	−0.001***	−0.001***
BM	?	−0.018***	−0.018***
AUDITOR	−	−0.005	−0.005
WRITEOFF	+	0.008***	0.007***
Log-Likelihood		6639.75***	6722.62***
n		4,961	4,961

(*continued on next page*)

TABLE 5 (continued)

Panel C: Tobit Regression Results Using Firms that Report *Positive* Abnormal Accruals Conditional on Firms that Remediate Internal Control Weaknesses

		Positive *AQM*	
	Exp. Sign	***AB_ACC***	***AB_WCACC***
Intercept	?	0.078***	0.070***
WEAKCONTROLS	+	0.006**	0.002
ICD_FIXED	−	−0.007*	0.002
SEGMENTS	?	0.000	0.000
FOREIGN_SALES	?	−0.004*	−0.003**
GROWTH	+	0.003*	0.001
INVENTORY	+	0.059***	0.065***
M&A	+	0.001	0.001
RESTRUCTURE	+	−0.002	−0.003
STD_CFO	+	0.079***	0.076***
STD_SALES	+	0.021***	0.031***
INT_INTENSITY	+	−0.003***	−0.002***
NO_INT	−	0.003	0.003
CAP_INTENSITY	−	−0.014***	−0.020***
SIZE	−	−0.004***	−0.004***
%LOSS	+	0.013***	0.013***
ZSCORE	−	0.000	0.000
BM	?	−0.009***	−0.011***
AUDITOR	−	−0.001	0.001
WRITEOFF	+	−0.001	−0.002
Log-Likelihood		3793.04***	3624.54***
n		2,475	2,397

Panel D: Tobit Regression Results Using Firms that Report *Negative* Abnormal Accruals Conditional on Firms that Remediate Internal Control Weaknesses

		Negative *AQM*	
	Exp. Sign	***AB_ACC***	***AB_WCACC***
Intercept	?	−0.095***	−0.081***
WEAKCONTROLS	−	−0.006**	−0.010***
ICD_FIXED	+	0.015***	0.018***
SEGMENTS	?	0.001	0.001
FOREIGN_SALES	?	0.010***	0.008***
GROWTH	−	−0.004**	−0.007***
INVENTORY	−	−0.012	−0.027**
M&A	−	−0.008***	−0.006***
RESTRUCTURE	−	0.003	0.006**
STD_CFO	−	−0.150***	−0.152***
STD_SALES	−	−0.035***	−0.030***
INT_INTENSITY	−	−0.004***	−0.002**
NO_INT	+	0.001	−0.003

(*continued on next page*)

TABLE 5 (continued)

	Exp. Sign	Negative *AQM*	
		AB_ACC	*AB_WCACC*
CAP_INTENSITY	+	0.015**	0.020***
SIZE	+	0.002***	0.001*
%LOSS	−	−0.019***	−0.019***
ZSCORE	+	0.002***	0.002***
BM	?	0.023***	0.020***
AUDITOR	+	0.017**	0.015**
WRITEOFF	−	−0.014***	−0.012***
Log-Likelihood		3250.95***	3504.33***
n		2,486	2,564

***, **, * Denote significant at the 0.01, 0.05, 0.10 levels, respectively.

WEAKCONTROLS = 1 if the firm disclosed a material weakness under SOX 302 or received a SOX 404 adverse opinion in the current or prior fiscal year of analysis, and 0 otherwise;

ICD_FIXED = an interaction term between the *WEAKCONTROLS* dummy and a second dummy that is set equal to 1 if the firm subsequently receives an unqualified SOX 404 opinion in the year of analysis, and 0 otherwise.

See the Appendix for other variable definitions.

abnormal accruals relative to those ICD firms that were not able to remediate their control problems (*WEAKCONTROLS* firms) after controlling for other innate firm characteristics that affect accrual quality.[20]

Panels C and D of Table 5 repeat the remediation analysis using signed accruals and conditioning on whether firms report positive or negative abnormal accruals, respectively. We predict that firms that remediate previously reported material weakness ICDs will report smaller positive abnormal accruals and less negative abnormal accruals. Thus, conditional on abnormal accruals being positive (negative) we expect the coefficient on *ICD_FIXED* to be negative (positive).

In Panel C of Table 5, we find a positive and significant relation between *WEAKCONTROLS* and *AB_ACC* for firms that report positive abnormal accruals and a negative and marginally significant coefficient on *ICD_FIXED* as predicted. We do not find significant coefficients on *WEAKCONTROLS* and *ICD_FIXED* for the positive abnormal working capital accruals analysis. For abnormal negative accruals reported in Panel D of Table 5, the results are consistent with our predictions. For both negative abnormal total and abnormal working capital accruals, we find a negative and significant coefficient on *WEAKCONTROLS* and a positive significant coefficient on *ICD_FIXED*. Thus, these findings provide further evidence that ICD firms that remediate their previously reported material weakness ICDs exhibit significant improvement in accrual quality, while firms with continuing control problems continue to exhibit larger abnormal accruals.

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[20] The incremental absolute abnormal accruals of the *ICD_FIXED* firms relative to the non-ICD firms is given by $\beta_1 + \beta_2$. The summation of these two coefficients is not significantly different from zero, consistent with our prediction that firms that remediate control problems exhibit absolute abnormal accruals that are statistically indistinguishable from abnormal accruals reported by non-ICD firms.

A competing explanation for our remediation results is that managers may become more cautious or more conservative in their accounting choices in the year of remediation. If managers of remediation firms become more conservative in their accounting choices, then one would expect to see these firms exhibit *smaller* positive abnormal accruals and *larger* negative abnormal accruals because more conservative accounting results in recognizing losses in a more timely fashion than gains. In Panels C and D of Table 5 we show that the reduction in the magnitude of abnormal accruals observed in Panel B is driven primarily by the negative abnormal accruals of *ICD_FIXED* firms becoming *less negative*, as evidenced by the positive coefficient on *ICD_FIXED* when abnormal accruals are negative. However, this result is opposite of what one would expect if managers become more conservative in their accounting choices.

We also run a Basu (1997) reverse regression of earnings on positive and negative returns and an interaction term for the year when the internal control problems are remediated. If managers become more cautious or conservative in their accounting choices in the year of remediation, then we would expect to find a significantly more positive coefficient between earnings and negative returns in the year of remediation. In untabulated results, we do not find this to be the case. Another possible manifestation of managers becoming more cautious in their accounting choices is avoidance of any form of unusual accounting, which could yield large negative and large positive accruals. We acknowledge that this competing explanation cannot be ruled out. However, if the disclosure of an ICD elicits such actions by management, then we would expect to see a reduction in the magnitude of positive and negative abnormal accruals in the year following the initial ICD disclosure for the non-remediation group of ICD firms as well, but we do not.

Another potential concern with our remediation results is that the firms that are able to remediate their control problems may have higher quality accruals relative to the non-remediation firms even *before* remediation because the remediation firms may be fundamentally different from the non-remediation firms along dimensions not measured in Equation (7). To test this possibility, we re-run the specification for Equation (6) in Table 4 but include an *ICD_FIXED* dummy variable along with the *ICD* dummy variable. We use Equation (6) because the accrual quality metrics for this specification are from periods prior to remediation. The coefficients on the *ICD* and *ICD_FIXED* variables allow us to test whether the accrual quality measures for the remediation ICD firms are different from those of the non-remediation ICD firms in the periods prior to remediation. The untabulated coefficient estimates for *AB_ACC* and *AB_WCACC* measures for the non-remediation ICD firms are 0.007 and 0.006, respectively, while the coefficient estimates for the remediation firms are 0.005 and 0.004, respectively. None of the coefficient estimates is significantly different between the remediation and non-remediation samples, but both sets of coefficient estimates are significantly higher relative to the control (non-ICD) sample. Thus, these results indicate that the accrual quality measures of firms that eventually remediate their control problems are no different from those firms that fail to remediate their control problems in the periods before remediation, but both groups of ICD firms exhibit poorer quality accruals relative to non-ICD control firms.

Intertemporal Analysis of SOX Opinions across Successive Years

In the analyses above we investigate whether the presence of ICDs and the remediation of ICDs are manifest in predictable differences in accrual quality across firms. We now extend this analysis by examining intertemporal changes in accrual quality for firms that received SOX 404 opinions on internal controls in both 2004 and 2005.[21] These two-year tests provide a unique natural setting for establishing a stronger cause-effect relation between the effectiveness of internal controls and accrual quality. Moreover, the successive year analysis allows us to address the question of whether the changes in accrual quality are contemporaneous with changes in internal control effectiveness.

Panel A of Table 6 reports the classification of firms having two SOX 404 opinions. There are 76 firms that received an adverse SOX 404 opinion in 2004 and in 2005. We label these firms *ADV_ADV*. The other group of firms that had no change in their controls over 2004 and 2005 are the 1,562 firms that received an unqualified SOX 404 opinion in both 2004 and 2005—the *UNQ_UNQ* firms. We identify 90 firms whose first SOX 404 opinion was unqualified but their second SOX 404 opinion was adverse (*UNQ_ADV*).[22] There are 214 firms that received an adverse SOX 404 opinion in 2004, but remediate their internal control problems in the following year as evidenced by receiving an unqualified SOX 404 opinion in 2005 (*ADV_UNQ*).

We use these four distinct groups described in Panel A of Table 6 to provide a stronger test of the effects of internal control on accrual quality by examining *within-firm changes* in accrual quality conditional on *changes* in strength of internal control as confirmed by independent SOX 404 opinions.

Panel A of Table 6 also reports the univariate descriptive statistics on ΔAB_ACC and ΔAB_WCACC for the four subsamples of firms that have two SOX 404 reports, where the change is calculated as the firm-specific difference in 2005 less 2004 values of the absolute value of these accrual quality metrics. On average, the change in abnormal total accruals or abnormal working capital accruals is less than 1 percent of total assets for firms that report no change in the status of their internal controls, i.e., the *UNQ_UNQ* and *ADV_ADV* firms. The tabled significance levels for the "No Change Firms" indicate that the mean and median values of the change in the accrual quality metrics are not statistically different from zero, as expected.

In contrast, we find that firms that had a *change* in the strength of internal control quality as evidenced by different SOX 404 opinions in 2004 and 2005 experienced significant *changes* in accrual quality in predicted directions. Firms receiving an unqualified SOX 404 opinion in 2004 followed by an adverse SOX 404 opinion in 2005 reported significantly larger absolute abnormal accruals (mean change of 1.9 percent of total assets) in 2005 relative to 2004. Conversely, firms that received an adverse SOX 404 opinion in 2004 and an unqualified SOX 404 opinion in 2005 reported a significant decline in abnormal total accruals and abnormal working capital accruals, on average, of 1.3 percent and 0.8 percent of total assets, respectively.

To ensure the changes in accrual quality are not driven by changes in firms' economic or operating situations, we estimate the following change form model:

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[21] The samples that underlie our two-year analysis reported in Table 6 below differ somewhat from the samples reported in Table 5 because in Table 6 we required firms to have two successive years of SOX 404 opinions (2004 and 2005), while in Table 5 we do not impose this sample restriction. Because of the effective date for SOX 404 (firms with fiscal years ending on or after November 15, 2004), the successive year analysis reported in Table 6 is essentially limited to firms with December 31 fiscal year-ends, while Table 5 includes firms with fiscal year-ends throughout the calendar year.

[22] One possible explanation for the deterioration in internal controls from 2004 to 2005 is that the firm was involved in a merger or acquisition in 2005 and control problems associated with integrating systems of newly acquired entities were not fully resolved by the time of the 2005 SOX 404 audit.

TABLE 6
Within-Firm Changes in Accrual Quality using Firms with Two SOX 404 Opinions

Panel A: Univariate Tests of Within-Firm Changes in Abnormal Accruals

	Mean	p-value	Median	p-value
No Change Firms				
Unqualified 2004, Unqualified 2005 (*UNQ_UNQ*) n = 1,562				
ΔAB_ACC	−0.003	0.10	0.000	0.74
ΔAB_WCACC	−0.002	0.30	0.000	0.69
Adverse 2004, Adverse 2005 (*ADV_ADV*) n = 76				
ΔAB_ACC	−0.010	0.28	−0.009	0.49
ΔAB_WCACC	−0.009	0.35	−0.007	0.49
Change Firms				
Unqualified 2004, Adverse 2005 (*UNQ_ADV*) n = 90				
ΔAB_ACC	0.019	0.04	0.010	0.04
ΔAB_WCACC	0.014	0.09	0.000	0.50
Adverse 2004, Unqualified 2005 (*ADV_UNQ*) n = 214				
ΔAB_ACC	−0.013	0.04	−0.006	0.15
ΔAB_WCACC	−0.008	0.06	−0.003	0.19

Panel B: Multivariate Analysis of Within-Firm Changes in Abnormal Accruals using OLS Regression

$$\begin{aligned}\Delta \mathit{AQM} = {} & \beta_0 + \beta_1 \mathit{ADV\_ADV} + \beta_2 \mathit{UNQ\_ADV} + \beta_3 \mathit{ADV\_UNQ} + \beta_4 \Delta \mathit{SEGMENTS} \\ & + \beta_5 \Delta \mathit{FOREIGN\_SALES} + \beta_6 \Delta \mathit{GROWTH} + \beta_7 \Delta \mathit{INVENTORY} + \beta_8 \Delta \mathit{M\&A} \\ & + \beta_9 \Delta \mathit{RESTRUCTURE} + \beta_{10} \Delta \mathit{STD\_CFO} + \beta_{11} \Delta \mathit{STD\_SALES} \\ & + \beta_{12} \Delta \mathit{INT\_INTENSITY} + \beta_{13} \Delta \mathit{NO\_INT} + \beta_{14} \Delta \mathit{CAP\_INTENSITY} \\ & + \beta_{15} \Delta \mathit{SIZE} + \beta_{16} \Delta \mathit{\%LOSS} + \beta_{17} \Delta \mathit{ZSCORE} + \beta_{18} \Delta \mathit{BM} + \beta_{19} \Delta \mathit{AUDITOR} \\ & + \beta_{20} \Delta \mathit{WRITEOFF} + \varepsilon\end{aligned}$$

		ΔAQM Equals	
	Exp. Sign	*ΔAB_ACC*	*ΔAB_WCACC*
Intercept	?	−0.005*	−0.004
ADV_ADV	?	−0.004	−0.003
UNQ_ADV	+	0.019**	0.013**
ADV_UNQ	−	−0.007*	−0.003
ΔSEGMENTS	?	−0.001	0.000
ΔFOREIGN_SALES	?	0.000	0.002
ΔGROWTH	+	0.002	0.007**
ΔINVENTORY	+	0.112*	0.109*
ΔM&A	+	0.009**	0.006*
ΔRESTRUCTURE	+	0.002	0.004
ΔSTD_CFO	+	0.059*	0.087**
ΔSTD_SALES	+	0.067***	0.045**
ΔINT_INTENSITY	+	0.009***	0.009***
ΔNO_INT	−	−0.005	0.007
ΔCAP_INTENSITY	−	−0.136***	−0.141***
ΔSIZE	−	0.024***	0.021***

(*continued on next page*)

TABLE 6 (continued)

	Exp. Sign	ΔAQM Equals ΔAB_ACC	ΔAB_WCACC
$\Delta \%LOSS$	+	0.017	0.014
$\Delta ZSCORE$	−	−0.005***	−0.005***
ΔBM	?	−0.019*	−0.011
$\Delta AUDITOR$	−	−0.004	−0.001
$\Delta WRITEOFF$	+	0.005*	0.002
Adj. R^2		0.04	0.03
n		1,942	1,942

***, **, * Denote significance at the 0.01, 0.05, 0.10 levels, respectively.
Δ is the difference between 2005 and 2004.
See the Appendix for other variable definitions.

$$\begin{aligned}\Delta AQM = {} & \beta_0 + \beta_1 ADV\_ADV + \beta_2 UNQ\_ADV + \beta_3 ADV\_UNQ \\ & + \beta_4 \Delta SEGMENTS + \beta_5 \Delta FOREIGN\_SALES + \beta_6 \Delta GROWTH \\ & + \beta_7 \Delta INVENTORY + \beta_8 \Delta M\&A + \beta_9 \Delta RESTRUCTURE \\ & + \beta_{10} \Delta STD\_CFO + \beta_{11} \Delta STD\_SALES + \beta_{12} \Delta INT\_INTENSITY \\ & + \beta_{13} \Delta NO\_INT + \beta_{14} \Delta CAP\_INTENSITY + \beta_{15} \Delta SIZE \\ & + \beta_{16} \Delta \%LOSS + \beta_{17} \Delta ZSCORE + \beta_{18} \Delta BM + \beta_{19} \Delta AUDITOR \\ & + \beta_{20} \Delta WRITEOFF + \varepsilon \end{aligned} \tag{8}$$

where Δ refers to the within-firm difference in the variable of interest, i.e., the 2005 value less the 2004 value; and all variables are as previously defined. If the effect of the control variables on accrual quality is constant over time, then taking the difference in accruals quality should control for the time-invariant effects.

In order to avoid over-identification of our model, we drop the *UNQ_UNQ* dummy variable designation while retaining the other three group designations. Effectively this means that the intercept measures the average change of the accrual quality metric from 2004 to 2005 for sample firms that received clean SOX 404 opinions in both years.

Panel B of Table 6 reports the results from estimating Equation (8). We find 11 (9) of the 17 coefficients on the control variables are significant with the predicted signs in the abnormal total (working capital) accruals model. Turning to the variables of interest, we find no significant coefficient for the *ADV_ADV* firms. Thus, firms that had no change in the quality of internal controls from 2004 to 2005 exhibit no significant change in the two accrual quality metrics as expected. However, we find a significant positive coefficient on *UNQ_ADV* in both the ΔAB_ACC and ΔAB_WCACC analysis. These results indicate that firms that had a breakdown in their internal controls in 2005 report less reliable accruals relative to the accruals reported when internal controls were deemed effective as evidenced by an unqualified SOX 404 opinion in 2004. The marginally significant negative coefficient on *ADV_UNQ* in the abnormal total accruals analysis provides some evidence that firms that remediate their 2004 ICDs in 2005 report more reliable accruals after the quality of their internal controls has improved. Overall, the results presented in Table 6 provide evidence that changes in internal control quality lead to predictable changes in accruals quality.

Moreover, the observed changes in accrual quality are concurrent with changes in the effectiveness of internal controls, which mitigates concerns about possible lag effects between changes to internal controls and when these changes manifest in changes in accruals quality.

VI. SUMMARY AND CONCLUSIONS

A fundamental premise underlying the SOX provisions for reporting on the effectiveness of internal control over financial reporting is that effective internal control provides a significant benefit to investors by reducing both intentional and unintentional misstatements in measuring, recording, and processing financial information that leads to more reliable financial statements. Using the setting of SOX-related internal control reporting requirements, we first conduct several cross-sectional tests to assess whether the presence of internal control deficiencies contributes to less reliable financial information as proxied by lower quality accruals. We assess accrual quality by documenting how well accruals map into past, present, and future operating cash flows and by the magnitude of abnormal total and working capital accruals.

Second, following subsequent audit reports on internal control mandated by AS No. 2, we then test whether: (1) remediation confirmation is associated with improvement in accrual quality, and (2) non-remediation is associated with no change in accrual quality. To further establish a causal link between the effectiveness of internal controls and accrual quality, we also examine whether firms with different SOX 404 opinions in successive years (unqualified-adverse and adverse-unqualified) exhibit changes in accrual quality that move in opposite directions consistent with the changes in internal control quality.

After controlling for a variety of innate firm characteristics that prior research shows to be related to accrual quality, we find firms that disclose ICDs exhibit greater noise in accruals and larger abnormal accruals (both unsigned and signed) relative to non-ICD firms. These results are more consistent with ICDs introducing unintentional errors into the accruals process with offsetting effects on earnings rather than intentional misstatements that result in income-increasing accruals. We also find that firms that remediate previously disclosed material weakness ICDs that are confirmed by an unqualified SOX 404 audit opinion exhibit significant improvements in accrual quality relative to ICD firms that fail to remediate their control problems. However, we acknowledge the possibility that the smaller magnitude of abnormal accruals for the remediation sample is due to these firms becoming more cautious or conservative in their accounting choices after ICDs have been revealed. In our intertemporal tests, we find that firms receiving an unqualified SOX 404 opinion in 2004 and an adverse opinion in 2005 experience a significant decrease in accrual quality between the two years, while firms receiving an adverse SOX 404 opinion in 2004 and an unqualified opinion in 2005 exhibit a marginally significant increase in accrual quality. Collectively, our cross-sectional and intertemporal change analysis test results are consistent with differences in internal control effectiveness having a significant impact on accrual quality.

As of November 2007, SOX 404 audit requirements for firms with less than $75 million in market capitalization (nonaccelerated filers) are scheduled to become effective for fiscal years ending on or after December 15, 2008. A fruitful extension of the present study would be to investigate whether those smaller companies that self-reported ICDs under SOX 302 exhibit improved accrual quality prior to receiving independent auditor verification of internal control effectiveness through an unqualified SOX 404 opinion. Such an analysis would provide useful evidence for weighing a potential benefit of SOX 404 management assessment and independent audits against the widely documented costs of such requirements (SEC 2006). Similarly, because our tests use audited annual report accruals, another fruitful extension would be to assess the effect of SOX 404 audits on quarterly financial statement accruals that are reviewed, but not audited, by the external auditor.

APPENDIX
VARIABLE DEFINITIONS

Variable	Definition
ICD	Equal to 1 if the firm is identified as having weak controls by either the 302 disclosure of 404 audit opinion, and 0 otherwise.
ICD_FIXED	Equal to 1 if firm is identified as having weak controls by either the 302 disclosure of 404 audit opinion and subsequently received an unqualified SOX 404 internal control audit opinion, and 0 otherwise.
AB_ACC	Abnormal accruals measured by the absolute value of performance-adjusted abnormal accruals (see the text for details).
AB_WCACC	Abnormal working capital accruals measured by the absolute value of performance-adjusted abnormal accruals (see the text for details).
WCACC_NOISE	Working capital accruals noise (see the text for details).
SEGMENTS	Number of reported business segments (Compustat Segment file).
FOREIGN_SALES	Equal to 1 if a firm reports foreign sales, and 0 otherwise (Compustat Segment file).
GROWTH	Average growth rate in sales for the prior three years (percent change in Compustat #12).
INVENTORY	Inventory divided by total assets (Compustat #3/#6).
M&A	Equal to 1 if a firm is involved in a merger or acquisition in the prior three years, and 0 otherwise (Compustat AFNT #1).
RESTRUCTURE	Equal to 1 if a firm is involved in a restructuring in the prior three years, and 0 otherwise. This variable is coded 1 if any of the following Compustat data items are non-zero: 376, 377, 378, or 379.
STD_CFO	Standard deviation of cash flow from operations divided by total assets (Compustat #308/#6), where the standard deviation is calculated using the prior five fiscal years, requiring a minimum of three years of data.
STD_SALES	Standard deviation of sales divided by total assets (Compustat #12/#6), where the standard deviation is calculated using the prior five fiscal years, requiring a minimum of three years of data.
INT_INTENSITY	Intangible asset intensity measured as R&D plus advertising divided by sales ((Compustat #46 + #45)/#12).
NO_INT	No intangible asset categorical variable equal to 1 if *INT_INTENSITY* is equal to 0, and 0 otherwise.
CAP_INTENSITY	Capital asset intensity measured as net property, plant, and equipment divided by total assets (Compustat #8/#6).
SIZE	Natural log of total assets (Compustat #6).
%LOSS	Proportion of the current and prior two (minimum) to four (maximum) years that a firm reports negative earnings.
ZSCORE	Decile rank of Altman's (1980) Z-score, where lower rank values represent greater distress risk.
BM	Book value of equity (Compustat #60) divided by market value of equity at fiscal year-end (Compustat #199 × #25).

Variable	Definition
AUDITOR	Equal to 1 if a firm engaged one of the largest six audit firms, and 0 otherwise (Compustat). The largest six audit firms include PWC, Deloitte & Touche, Ernst & Young, KPMG, Grant Thornton, and BDO Seidman.
WRITEOFF	Equal to 1 if the firm reported a writedown in the fiscal year (Compustat #380), and 0 otherwise.

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BOOK REVIEWS

Stephen A. Zeff, Editor

Editor's note: Two copies of books for review should be sent to the Book Review Editor: Stephen A. Zeff, Rice University, Jesse H. Jones Graduate School of Management, 6100 Main St., Houston, TX 77005. The policy of *The Accounting Review* is to publish only those reviews solicited by the Book Review Editor. Unsolicited reviews will not be accepted.

JOHN C. COFFEE, JR., *Gatekeepers: The Professions and Corporate Governance* (Oxford, U.K.: Oxford University Press, 2006, ISBN 0-19-928809-7, pp. 389).

Accountants and students of accounting interested in the future of the profession of independent accountant/auditor should read this book by John C. Coffee, Jr., who is a Professor at Columbia University law school. I find many of his arguments about gatekeeper failures in recent years cogently presented and his suggestions for constructive change worthy of serious consideration. For instance, I found his argument for litigation reform sufficiently strong to cause me to adjust my previously almost complete opposition to relief for the profession in this area. I continue to oppose the simple caps most often proposed by the profession's representatives; however, a more nuanced reform does seem appropriate. Perhaps the profession should recall the argument that it was the acceptance of the risk of being sued for substandard audit work that enhanced the profession's credibility in the early years of the 20th century.

Chapter 1 is an excellent introduction to the book's content. In ten well-written pages, the reader has no doubt about Coffee's objectives, a pretty fair idea about his direction of thought, and a taste of his reformist recommendations. Fundamental to Coffee's outlook is his reliance on "corporate governance" as an important element of reform. He does not address reform within the corporate structure, because he believes that academic governance research has already focused too heavily on the board and shareholders without adequate attention to those (morally reluctant) professionals who inform and advise them: auditors, attorneys, securities analysts, credit-rating agencies, and investment bankers. He intends to rectify this omission by: (1) reviewing the recent history culminating in the Sarbanes-Oxley Act of 2002 (SOX) (Chapters 2–4), (2) exploring the institutional histories of the gatekeepers (Chapters 5–8), and (3) suggesting models for reform (Chapters 9–11).

Coffee succeeds admirably with objectives (1) and (2)—especially a description of the "perfect storm" that seems to have enveloped each of the professions simultaneously—and offers tantalizing ideas on the third objective. He offers no easy agenda for reform, most likely because no simple agenda exists. Nevertheless, when offering models of reform, he clearly leaves the reader wanting something more robust and integrated. Nevertheless, I know of no better document than this one in helping us understand how we arrived at our current position and the need for reform.

Coffee's primary focus is not on reforming the board of directors, but rather on the importance of gatekeepers to the board's performance. He makes four observations to justify his focus on the gatekeepers:

1. "Gatekeepers enable a corporation to credibly signal above average quality and thereby achieve a lower cost of capital" (p. 6).
2. "No board can outperform its gatekeepers" (p. 7).
3. "Over recent decades, the board of directors has already been extensively reformed and is now an independent, harder-working and more proactive body" (p. 7).
4. "Logically, one cannot explain the sudden outburst of financial irregularity that surfaced in 2001 to 2003 by attributing it to the failure of the board of directors. Rather, because boards have only improved over

> the interval from 1980 to 2000, one needs to explain this increase in financial irregularity by identifying other actors whose performance deteriorated" (p. 8).

Item (1) is the generally accepted rationale in our capitalist economy. According to Item (2), he writes, "all boards of directors are prisoners of their gatekeepers. No board of directors—no matter how able and well-intentioned its members—can outperform its professional advisors. Only if the board's agents properly advise and warn it, can the board function efficiently" (p. 1). Coffee is no doubt correct in pointing out that the advisors are critical to the board's ultimate success. I am not convinced that Item (3) is sufficiently correct to lead to the conclusion stated in Item (4), that boards do not deserve a share of the blame for the recent financial debacles. Despite the importance of the board, Coffee seems to have placed it in a rather passive role despite its proximity to, and power over, management. As a result, I believe he fails to exploit the potential for board reform as part of the solution to the recent failures.

Gatekeeping, according to Coffee, is fundamentally the domain of agents that act as repeated reputational intermediaries for multiple entities over time in order to assure investors as to the quality of the "signal" sent by the corporate issuer. The board is not, he writes, a gatekeeper. By narrowing his definition, Coffee can concentrate on the auditor, attorney, securities analyst, credit-rating agency, and investment banker as the gatekeepers who must inform the board. Even though this position is consistent with Coffee's narrow interpretation of a gatekeeper, once again, it leads to his failure to provide an in-depth discussion of potential changes in board responsibilities and composition.

It is important to remember that board members are second only to management as insiders. They have it within their power to insist on a strong oversight role and to require that management provide the information they need to meet the demands of that role. Certainly, Coffee's gatekeepers are crucial information sources, and failures by these gatekeepers to perform their function can "blind" the board; however, a proactive board has access to much of the information these gatekeepers seek and need to perform adequately. The board has the potential both to overcome the inadequacies of their gatekeepers and, at the same time, to assure that the gatekeepers receive the information they need to perform their functions.

I was also struck by what appears to be Coffee's underlying view that corporate management is the auditor's client in a largely private contracting context. He is, of course, fully aware of the public responsibility imposed on the auditor by regulation and the courts. Coffee cites *United States v. Arthur Young & Co.* in making this point:

> By certifying the public reports that collectively depict a corporation's financial status, the independent auditor assumes a *public* responsibility transcending any employment relationship with the client. The independent public accountant performing this special function owes ultimate allegiance to the corporation's creditors and stockholders, as well as to the investing public. This "public watchdog" function demands that the accountant maintain independence from the client at all times and requires complete fidelity to the public trust. (p. 4) (emphasis in the original)

This paragraph neatly sums up the problem of a corporate client, whether represented by management or the audit committee of the board, which pays the auditor's fee under what appears to be a private contract and yet demands the necessary independence to satisfy the public trust of the public clients: investors and other third parties who rely on the certified information. Nevertheless, the view that management was the auditor's principal in a private contractual relationship seems fundamental to Coffee's views, at least pre-SOX, as suggested by the following:

> Because the gatekeeper is inherently an agent of its principal, its expected fee or commission is likely to be far less than the gain that the principal itself expects to make from the transaction. As a result, because the gatekeeper/agent expects less profit than its principal does, it can be more easily deterred than its principal. Thus, whether because of the risk of litigation or fear of a devalued reputation, gatekeepers should be less willing than their principals to violate the law. Hence, by focusing on the gatekeeper, law enforcement wisely focuses on the weakest link in the chain and may be able to interdict misconduct, even when it cannot effectively deter the principal. (p. 5)
>
> No chain is stronger than its weakest link. Much evidence will be advanced to suggest that during the 1990s gatekeepers became the weakest link. (p. 8)

It is important to remember that Coffee, while applying these comments to auditors, addresses a problem common to all gatekeepers.

I found Coffee's description of the three characteristics he considers common to all of the gatekeepers very interesting when applied to auditors (each quotation is followed by my comments):

1. They "protect their professional autonomy and resist efforts of both state and federal regulators" (p. 104). The auditing profession's success in retaining self-regulations was the result in our field. Despite the recent rather spectacular failure, the profession has obviously not given up.
2. They "resisted any obligation to be judgmental about their clients" (p. 104) as they sought to limit their responsibilities. While perhaps more true of other gatekeepers, the independent accountant's continuing and intense interest in litigation reform, even after the Private Securities Litigation Reform Act of 1995, and their equally continuing and intense resistance to any serious responsibility for the discovery of material error or fraud are symptomatic.
3. In recent decades, "each of these professions appears to have lost leverage vis-à-vis their clients" (p. 104). For auditors, the inability to resist pressure can be inferred when legislation and regulation are needed to make pressures brought on the independent accountant against the law (e.g., Section 303 of the Sarbanes-Oxley Act).

Coffee asks: Why do gatekeepers fail? He offers the following four explanations applicable not only to the independent accountants, but also to all gatekeepers:

1. "[a]gency cost problems that make acquiescence in misconduct rational for the agents and employees of the gatekeeper, even though it is irrational for the gatekeeper, itself" (p. 6). Nonaudit fees or the prospect of nonaudit fees, compensation for cross-selling, local control over the application of accounting principles and practices all contributed to altering these agency cost relationships.
2. "[i]mperfectly competitive markets for gatekeeper services that allow rival firms to collude or pursue consciously parallel practices" (p. 6). With only a small number of large firms, the opportunities for subtle collusive behaviors are increased. For example, when each firm is too big to fail, they may all accept greater risks to their reputation without a real fear of significant loss in revenue.
3. "[a] possible decline in value of the gatekeeper's reputational capital, with the result that the gatekeeper no longer protects it as zealously" (p. 6). When markets provide all participants with larger than expected returns, they may not care very much about the auditor's certification.
4. "[r]educed exposure to litigation" (p. 6).

These explanations are translated into three gatekeeper failure hypotheses:

1. "The decline in deterrence hypothesis" (p. 55).
2. "The increased managerial pressure hypothesis" (p. 55).
3. "The stock market bubble hypothesis" (p. 56).

The balance of the book addresses each of these explanations and hypotheses and how the infrastructure of the gatekeepers can be rehabilitated and redesigned to serve boards and the public.

In my opinion, though some very interesting reforms are recommended, his argument is weakest in offering an integrated program for reform. The "Strategic Options" for rehabilitation and redesign can be summarized as follows (p. 9):

1. Restructuring the principal-agent relationships for gatekeepers.
2. Reducing investor-management information asymmetries through:
    a. *Ex post* legal strategies and litigation to hold agents accountable and provide incentives for future good behavior.
    b. *Ex ante* reliance on gatekeepers based on bonding and reputational capital.

These are hard to argue with in principle, although, given recent events, Item (1) seems to be a prerequisite to any strategy involving Item (2.b). In respect to the auditor, Coffee does observe that the Sarbanes-Oxley Act of 2002 did alter the relationship of the auditor to the management by interposing the audit committee as the auditor's principal. He also comments on the issues of independence and nonaudit services, but without the conviction of a reformist.

Coffee spends some space addressing the problems of the globalization of markets and the differing cultural, corporate, financial market, and legal environments. He does not allot much space or emphasis to the increasing risk and complexity of global business that further complicate the incentive alignment issues. He does make a number of salient observations that suggest significant difficulties in future coordination and convergence efforts. While not a major focus of his work, this chapter makes for interesting reading.

This book offers a cautionary message about the consequences of gatekeeper failures on the gatekeepers' future. It should be read by all practicing and academic accountants as well as by students preparing for careers in accounting and law.

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THE INTERNATIONAL FINANCIAL REPORTING GROUP OF ERNST & YOUNG, *International GAAP 2007* (London, U.K.: LexisNexis, 2006, ISBN 10: 1405712562, pp. xcvii, 2,653).

International GAAP 2007, by the international financial reporting group of Ernst & Young, U.K., is an immense piece of work, being both voluminous and detailed. The authors demonstrate in-depth knowledge of international accounting. No clear target audience is singled out, but the authors state that they hope the book will be of value to all who need to understand and apply IFRS. The subheading "Generally Accepted Accounting Practice" seems to set the focus on practical application (preparers, users, and auditors).

Chapters 1 and 2 (the development of international GAAP and the conceptual framework) should be of interest to an academic audience. Accounting students will find the book complex and detailed. The authors state that they have sought to set out clearly the thinking behind each standard, the meaning of its detailed requirements, and the practical matters to be considered when applying it. They also provide useful examples. The presentations of the different standards and the authors' comments are at times uneven, reflecting the fact that several authors have contributed to the text. The authors hope to contribute to developing an international consensus on the proper and consistent application of IFRS. This point will be reviewed in the conclusion.

In Chapter 1, principles- versus rules-based accounting is discussed. Because complete comparability is never possible, the authors think that emphasis needs to be placed on explaining key judgments made by the preparers of financial statements, including the sensitivities of those judgments (p. 69). The danger for IFRS, as they see it, is that the demand for implementation guidance may increase. Is this really a danger, or is it a necessity for *consistent application* of IFRS, an objective embraced by the authors? Also, the authors see a danger in IFRIC's overly officious and bureaucratic approach to adding issues to its agenda, which may diminish the effectiveness in helping to promote consistency (pp. 25–26). This is of substantial concern to preparers, auditors, and regulators, because they are all aware that divergent interpretations are already being applied, as acknowledged by the authors. The extent of *guidance needed* to achieve consistency seems underestimated by the authors. If IFRIC does not provide the necessary interpretations, then the Committee of European Securities Regulators (CESR) and the SEC are likely to make their own IFRS interpretations, necessitating a closer dialogue between the two bodies, thus undermining the position of IFRIC. This "danger" is not recognized by the authors. The authors think that the greatest challenge facing Europe in delivering an efficient single capital market is the task of efficient regulation and enforcement.

In Chapter 2, the importance of a conceptual framework is well pointed out. The FASB's SFAC No. 1 objectives are critically reviewed. SFAC No. 5 is criticized because the FASB describes different measurement attributes, but does not prescribe a particular measurement attribute or a particular concept of capital maintenance to be adopted by an entity. On the other hand, the FASB is commended for its work on the qualitative characteristics. The authors view the emphasis on substance over form as a key practical difference between the IASB's and FASB's frameworks. The IASB is criticized for not discussing which measurement basis might be preferable.

Inflation and historical cost accounting leading to the development of current purchasing power, replacement cost, present value, Chambers' continuously contemporary accounting, and cash flow accounting are also presented. The main features of the current IASB-FASB framework project are described, including the objective of financial reporting and the balance sheet approach to measuring performance. The elimination of the qualitative characteristic "reliability" as well as an explicit stewardship objective is reviewed. The authors criticize both Boards for not being explicit in their view on the use of fair values, including the justification for their use (p. 142). Finally, fair value and the FASB's SFAS No. 157 are described. The notion of "highest and best use" is not an easy one to explain in principle, and it is not completely obvious how it should be identified or used in practice (p. 160). In discussing the relevance of fair values, the authors refer to the objectives of financial reporting and correctly conclude that it is far from clear how the balance sheet presentation of hypothetical market values of individual assets will enable the users of financial statements to predict the amounts, timing, and uncertainty of an entity's future cash inflows and outflows. As elegantly stated by the authors, "Very often, because no deep and liquid markets exist for most assets, the fair value of an asset will be an hypothetical price calculated on the basis of hypothetical markets, with hypothetical buyers and sellers" (p. 164). All in all, Chapter 2 provides a good critical overview of conceptual frameworks.

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The authors' chosen sequence of presentation of the different accounting topics is surprising. Why are such important standards as "Revenue," "Property, plant, and equipment," "Cash flow statements," and "Segment reporting" presented much later than, for example, "Non-current assets held for sale and discontinued operations" and "Financial reporting in hyperinflationary economies"? In general, a less-detailed presentation of the different standards could have facilitated readability.

Chapter 5 is extensive and will prove useful to first-time IFRS adopters. It provides guidance and examples on certain issues not explicitly covered in IFRS No. 1 (e.g., minority interest, p. 283) and presents a diagram (p. 290) that summarizes the recognition and measurement rules for assets acquired and liabilities assumed, including the restatement of goodwill in a business combination that is accounted for under the business combinations exemption. The authors find it remarkable that the availability of reliable contemporaneous information for the application of IFRS No. 3 is not an explicit condition for the retrospective application of IFRS No. 3 by first-time adopters. As a whole, the authors compliment the IASB for taking a practical approach to first-time adoption.

Considerable attention is devoted to consolidation and business combinations (Chapters 6 and 7), and rightly so. The related standards have undergone major changes in recent years, and the chapters cover several issues and provide illustrative examples. The question of control is extensively discussed. The authors present the IASB's Business Combinations Phase II project in which it is proposed that consolidated goodwill include the minority's share of goodwill (economic entity concept). Currently, goodwill is recognized only to the extent of the controlling shareholder's interest (IAS No. 27 and IFRS No. 3). The authors correctly believe that the IASB and the FASB need to explain in greater detail the accounting theory and conceptual basis for each approach and the reasons why the economic entity view is believed to be superior to the parent entity view. The definition of a "business combination" is also discussed. The authors concur with the IASB on the goodwill impairment-testing approach, but raise the question as to whether the cost of performing such a test, rather than systematic amortization, may outweigh the benefits. Whether goodwill amortization over shorter time periods than those earlier practiced in the U.S. is value-relevant is not discussed. Earlier research has primarily been based on U.S. data. Finally, it is interesting to notice that the authors think that more detailed guidance is required when valuing intangibles, considering the danger that they generally see in increased guidance (Chapter 1).

The authors criticize IFRS for not prescribing where in the income statement the investor's share of the profit or loss of associates and joint ventures (Chapters 8 and 9) should be shown, thus leading to different approaches in practice. Foreign exchange issues, including functional currency and its determination, are discussed in Chapter 10. The authors provide guidance regarding the use of average rates for foreign currency transactions (p. 732).

Intangible assets and goodwill are treated in Chapter 12. Using an illustrative example (p. 827), the authors demonstrate that the guidance in IAS No. 38 seems to take a somewhat out-of-date view of how internally generated intangible assets are created and managed in practice (research, development, and production-stage intangibles), as well as what types of internally generated intangible assets there can be. IFRIC concluded in February 2002 that no new guidance is needed.

Chapter 13 on property, plant, and equipment is rather "light," considering the importance of these assets in many capital-intensive industries. The issues of revaluation and related uncertainty, as well as the possible confusion caused by valuing different classes of assets differently (cost, fair value) within the same entity, could have been addressed. Similar issues relate to investment property (Chapter 14). The authors correctly state that the income statement is a mixture of unrealized gains/losses due to fair value changes (p. 921). Unrealized gains constituted around 50 percent of reported profit in many European real estate companies in 2006, with consequential effects on P/E and other earnings ratios. Chapter 15 covers the impairment of fixed assets and goodwill. In determining value in use, complexity in the form of determining the cash flows and choosing a discount rate is present. As pointed out, the vagueness in the standard regarding how to determine the discount rate has left many entities unsure about how to proceed, thus affecting comparability between enterprises (pp. 960, 1020).

In Chapters 17 to 22, one of the main challenges to financial reporting, namely accounting for financial instruments, is presented. The authors are to be commended for providing a solid background of IAS No. 39 and IAS No. 32 and for providing an in-depth presentation of a difficult subject. This includes the political pressure exerted on the IASB because of the concerns expressed by banks and insurers that resulted in a "carve-out" version of IAS No. 39 in the European Union in order to satisfy key constituents. Issues are highlighted with examples. The problems of off-balance sheet financing, and legal and "economic" ownership are addressed (pp. 1033–1034).

The liability-equity classification (IAS No. 32) and consequential volatility effect are discussed. Because the assessment of hedging effectiveness is potentially an extremely difficult exercise, involving the use of complex statistical techniques and valuation models, the authors correctly criticize the IASB and IFRIC for not developing application guidance in this area (p. 1436).

Accounting for inventories (Chapter 23) has not stirred any major controversy. The authors, however, oppose the IASB's possible future intention to value inventory at fair value, because whether a sale is made or not made represents the fundamental essence of business risk, affecting the relevance and the reliability of financial statements (pp. 1586–1587).

The authors devote a significant amount of space to leasing, including the dissatisfaction with existing standards (Chapter 25). The authors discuss the proposal under which the financing/operating distinction would be removed and all rights and obligations arising under lease contracts would be recognized in the balance sheets of lessees. The G4+1 1996 Discussion Paper and 1999 Position Paper are reviewed. The latter is criticized on the basis that it focuses upon conceptual terms on the recognition of the acquired asset (right) "obtained by the lease," while the mechanics of the accounting are driven entirely by the recognition of the corresponding liability.

Income taxes are discussed in Chapter 26. Regarding unused tax losses, IAS No. 12 does not provide any specific guidance on the assessment of the availability of future tax profits. Neither does IFRIC. The authors think that it would be clearly appropriate to give more weight to revenues from *existing* orders and contracts than those from merely anticipated future trading (p. 1718). Considering the past practices of some telecommunications operators, the recommendation seems sound.

In Chapter 28, IAS No. 18 (Revenue) is discussed, including the IASB/FASB joint revenue recognition project in which revenue recognition is based on changes in assets and liabilities arising from contracts with customers. The risk that the carrying amounts of performance obligations might be used to report speculative future income is highlighted. One has to agree with the authors' conclusion that users need to know the operating performance of the business, which should clearly be distinguished from holding gains.

In Chapter 30, the important subject of segment reporting is taken up. The authors find it surprising that the IASB has replaced IAS No. 14 with IFRS No. 8 because they believe the disclosures required by IAS No. 14 to be more useful. The specification in IFRS No. 8 (§5) and SFAS No. 131 (§10), "Whose operating results are regularly reviewed by the entity's *chief operating decision maker* ..." (emphasis added) may, however, reduce flexibility in determining operating segments and thus more accurately reflect entity risks and returns than when applying IAS No. 14. Some research evidence points in this direction. The internal measurement approach of IFRS No. 8 is also questioned (pp. 2061–2062).

Accounting for share-based payment is a controversial topic and is extensively covered in Chapter 31. The length of the "basis for conclusions" of IFRS No. 2 leads to the question whether the standard rests on clear conceptual foundations. Some oppose the mandatory expensing on the grounds that, as yet, there is no option model robust enough to generate a reliable accounting measure. There exist a wide variety of arrangements for employee benefits in different jurisdictions, and thus the related accounting (Chapter 32) is complex and has frequently changed. The authors address the issue of recognizing actuarial gains and losses and the "corridor" as a practical damping mechanism to limit the impact on the financial statements of large and volatile fluctuations in value.

The authors think that EPS is arguably unique in its prominence and prevalence and thus some standardization is probably useful. However, the authors find IAS No. 33 both unclear and contradictory in places (p. 2364). In Chapter 34, cash flow statements are presented, and the authors conclude that IAS No. 7 is generally well understood by both the preparers and users of financial statements. Chapter 36 deals with related parties and includes useful examples of what constitutes related parties (pp. 2425–2427). Chapter 37 on interim financial reporting includes examples that illustrate the periods that an entity is required or encouraged to disclose under IAS No. 34. The standard is criticized for failing to consider adequately the essential purpose of interim reporting (p. 2499). Is interim reporting really only a more frequent version of annual reporting or a signaling device as to the outcome of the real period users are interested in, the financial year (installment approach)? Practice shows that reporting entities themselves appear to hold different opinions on what information should be included in an interim report.

IAS No. 41 (Agriculture) is controversial because of its requirement to use market-based valuations for growing crops and to take profit or loss on any change regardless of the timing or existence of any actual sales transaction. When no market prices exist for a partly grown crop, this will generally lead to the use of discounted cash flow models. The authors think that the suitability of discounted cash flow as a measurement basis should be explicitly evaluated by the standard setters and be opened to wider scrutiny, rather than being quietly subsumed under the guise of being a real market price.

To conclude, the treatise by Ernst & Young U.K. and similar volumes by other Big 4 accounting firms are likely to have a considerable impact on the actual practice of IFRS. Because the IASB emphasizes the principles approach and IFRIC does not provide guidance on many issues, one has to ask whether we have returned to the pre-FASB and pre-ASB eras, when the accounting profession decided on the actual application of standards. Is this the IASB's intention? The reviewed work constitutes, no doubt, a useful handbook for practitioners as well as for academics to acquire an in-depth, up-to-date analysis embracing the full spectrum of international GAAP.

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GARY GIROUX, *Earnings Magic and the Unbalance Sheet: The Search for Financial Reality* (Hoboken, NJ: John Wiley & Sons, 2006, ISBN 978-0-471-76855-5, pp. xv, 286).

A book written for investors and analysts, the Preface states "This book is designed to provide a relatively straightforward approach specifically to make the [investment] analysis doable" (p. xi). The book's focus on investor needs actually centers on financial reporting issues and joins a number of recent books that loosely attempt to satisfy the same needs, including, but not limited to: *The Financial Numbers Game: Detecting Creative Accounting Practices* (Wiley, 2002), by Charles W. Mulford and Eugene E. Comiskey; *Business Fairy Tales: Grim Realities of Fictitious Financial Reporting* (Thomson, 2006), by Cecil W. Jackson; *More Than a Numbers Game: A Brief History of Accounting* (Wiley, 2006), by Thomas A. King; and *Quality Financial Reporting* (McGraw-Hill, 2002), by Paul B. W. Miller and Paul R. Bahnson.

Giroux divides his book into the three sections discussed below, and uses the 30 Dow Jones Industrial firms (DJ30) to illustrate many of his points and analytical approaches.

Section 1, entitled "Earnings Magic and the Unbalanced Sheet," begins with an overview of some major financial reporting frauds, how the incompleteness and flexibility of GAAP contribute to the many facets of earnings management, and offers this definition of "earnings magic": "[the] opportunistic use of earnings management to effectively misstate earnings to benefit managers" (p. 8). Chapter 1 then examines the incentives for deception that facilitate earnings magic, and introduces the participants—preparers, auditors, users, and regulators—in the financial reporting process. After more detail on recent major frauds, such as Enron, WorldCom, and Tyco, Giroux describes theories put forth to explain scandals: a few "rotten apples," an excessively greed-based culture, a struggling regulatory structure, weak corporate governance processes, and the "creative destruction" tendencies in Schumpeter's "survival of the fittest" notion. But whatever the theory and the response to exposed frauds, earnings magic persists. Neither Sarbanes-Oxley, well-functioning corporate boards, the limits placed on auditors, aggressive standard setting, nor increased disclosures—that foster the transparency needed to depict financial reality—will rid the world of earnings magic. Two stakes driven through the heart of the vampire Dracula put him out of business. How many more will be needed to excise earnings magic is unknown.

Section 2, "The Big 8 and Dirty 30: Key Accounting Issues That Signal Earnings Magic," examines financial reporting issues judged to be unresolved or treated improperly by GAAP. These include executive stock options, postretirement benefits, revenue recognition, "special" items, off-balance-sheet financing, and others, comprising 55 percent of the book's contents. The analysis of such issues is generally good, but the following insights could have been added for completeness:

- Critics question whether expensing options based on *the grant date fair value* under SFAS No. 123R recognizes the "real cost," as claimed by the author on page 93, suggesting instead that expensing *the exercise date intrinsic value* (share price when exercised, or exercise price) better reflects the cost to the existing shareholders. Giroux does not mention this, or that this calculation can generally be made from footnote disclosures.
- Discussions of pension accounting tend to focus on recognizing the amount by which defined benefit plans are under- (over-) funded. The author also carefully examines the components of pension cost, suggesting that the reported pension cost be reduced by the *actual* return on plan assets, not the *expected* return. Omitted from the discussion on page 105 is the criticism that using *any* pension fund asset return to reduce pension cost commingles operating and investing results. When the pension fund does extremely well, this practice can magically convert an actual operating loss to an "operating profit."
- Giroux identifies the somewhat arbitrary bright-line lease accounting rules that facilitate much accounting chicanery, and favors capitalizing future minimum required operating lease payments to better understand the firm's true leverage. He applies this ratio: (the booked present value of capital lease payments/the total capital lease payments) multiplied by the total operating lease payments to estimate the latter's present value. On page 161, Giroux states that, for firms with operating leases only and no capital leases, the constructive capitalization of the operating leases is more complex. He omits the common alternative

approach that uses comparable long-term debt rates to discount the projected periodic operating lease payments.

Despite such carping by the reviewer, the author's analyses of the above topics, including business combinations and goodwill—30 sources of earnings magic in all—are provocative and helpful to anyone seeking to unravel the economic activity behind reported accounting numbers. But the final chapter in this section—"Dishonorable Mention: The Rest of the Dirty 30"—contains at least two more faux pas that mar the discussion. "Reserve accounts" appear on pages 193–194. Aside from ignoring the opportunity to condemn such euphemistic terminology, which makes something bad, such as an estimated liability, sound good, Giroux uncritically refers to a *Wall Street Journal* article, which, in his words, reports that GM and Ford "were putting less money into the reserves each quarter in 2005," as if there is any money at all in "reserve accounts." Then an unfortunate slip relating to cash flow from operations (CFO) states that "noncash expenses such as depreciation increase CFO" (p. 194).

In Section 3, "Putting It All Together," Giroux offers "a comprehensive analysis to determine if real transparency exists, which means that financial reality and the level of earnings magic can be estimated" (p. 221). This section has three main chapters:

- "Finding Signals of Financial Excellence and Earnings Magic" offers a four-step process culminating in a "how to" detect earnings magic and assess transparency. The chapter summarizes the "Big 8" reporting issues with narrative and a useful exhibit showing each issue next to an on-point synopsis of concerns.
- "A Checklist for Evaluating Financial Excellence" has some of the most useful material in the book. Giroux offers an "A to F" grading scale and applies that scale to: the basic financial and market analysis, "Big 8" issues, other "Dirty 30" items, and a "wild card" category including restatements, SEC probes, etc. He provides a checklist for scandal-plagued American International Group (AIG) and then grades the DJ30 on their reporting excellence, assigning B to three companies and C, D, or F to the other 27.
- "An Investment Strategy" applies Giroux's grading scheme to 16 of the DJ30, which he identifies as growth, income, or value investments. Investors with the determination to follow the suggested analytic approach—which does not make actual decisions—will find themselves thinking about alternative stock investments in a new and creative way.

Earnings Magic concludes with an annotated list of useful websites and a brief "Epilogue" reminding us that, while things change, they also remain the same. New players, contexts, rules, and scandals require vigilance in the dynamic pursuit of earnings magic and financial reality.

Overall, this is a readable and useful book that provides a good overview of earnings magic and how to assess the extent to which a company's financial reports reflect financial reality. Although the above comments point to some areas for improvement—of the type present in all books—Giroux gives us a disciplined approach to understanding a company's financial reporting quality and the resulting information risk as we contemplate alternative stock investments.

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NORMAN BELDING MACINTOSH, *Accounting, Accountants and Accountability: Poststructuralist Positions* (London, U.K.: Routledge, 2002, ISBN 0-415-38450-8, pp. xvi, 165).

This book provides an introduction to interdisciplinary accounting research that draws from the perspectives of sociology, philosophy, and literary theory. It is likely to be useful for graduate programs and for researchers looking for a general resource and guide to this body of work. The book may be especially useful for North American and other researchers for whom this body of work is unknown, and who might wish to better understand the research activities and goals of many colleagues in Europe, Canada, Australia, and elsewhere, whose work has been informed by disciplines beyond economics and social psychology.

Norman Macintosh is an internationally renowned author in this field, and his work in such journals as *Accounting, Organizations and Society* has been deeply influential. In addition to producing scholarly articles, he has written several books, including *The Social Software of Accounting and Information Systems* (1985) and *Management Accounting and Control Systems: An Organizational and Behavioral Approach* (1995). Macintosh approaches each project with great knowledge, thoughtfulness, and erudition; He writes in a lively and engaging way, and his care in explaining and applying key concepts makes this book an ideal introduction for readers who, though untutored in this area, are intellectually curious as to the work of colleagues across the world.

Other reviews of this book are available from the standpoint of the dedicated interdisciplinary researcher (Robson 2004). What I try to do here is to provide a sense of why this work might be of interest to a more general audience of scholars who might wish to look at accounting through a lens other than those with which they are familiar.

Macintosh starts with structuralism, addressing work that holds that structures as a form of organizing principle are present throughout nature and society. Modern economics is in essence structuralist, as is the informational perspective of accounting research. Macintosh explains how, for poststructuralists, there is no direct, unimpeded sense of meaning, and ideas must instead be interpreted through language and social discourses which change over time. This insight lends itself to a historical view, because shifts in dominant ideas and ways of understanding tend to undermine the immediate primacy of the ideas of any one age. Accordingly, Macintosh discusses the role of genealogical study in uncovering paths of ideas and practice, and of literary theory in allowing a nuanced view of how changing ways of speaking and writing serve to change understandings of key concepts as they are used in practice. He gives examples of changing views of oil and gas accounting as evidence of the power of these ideas.

Macintosh details the work of Baudrillard, a focus of some of his own more recent work, using this material to examine how signs may become disconnected from any real underpinnings, as when the central value of a particular set of Gucci-branded luggage comes from the sign that is the Gucci brand rather than from any attributes of manufacture. He uses this to analyze stock option accounting, examining efforts to tie the "sign" of income to the "real" referent to which it allegedly is tied, that being the expense to shareholders of stock options being exercised. As Macintosh notes, there is a circularity in such accounting that is hard to ignore:

> the accounting sign of the financial instrument is based on the market price of the instrument, while simultaneously that market price is based on accounting signs. ... The market uses accounting earnings ... along with other information, to value a company's stock and other securities. The prices of these securities then become the underlyings that sustain the derivative prices, which determine the company's earnings. ... (p. 74)

Macintosh sees Baudrillard's work as a key to addressing such circularity and making sense of an increasingly complex and hyper-real financial system.

A more well-rehearsed area of interdisciplinary research concerns the work of Michel Foucault and others focused on disciplinary structures. This work, which focuses on systems of surveillance, discipline, and punishment, draws in particular from Foucault's *Discipline and Punish.* The rules of early factories, the work of industrial pioneers such as Wedgwood; the Hawthorne experiments; the leading case of Empire Glass; ITT, the early multinational company; and Johnson & Johnson can all benefit from analysis using such perspectives. Harold Geneen's deep investment in accounting control systems at ITT as part of a "regime of reason," enforced by the drama of elaborate face-to-face managerial meetings, can be seen as an elaborate system of discipline and surveillance enforced by some 23,000 accountants and controllers. In this and other examples, the tools of social theory are meshed with the discipline of accounting history to provide an account that is grounded in practice. Much of the "new accounting history" has drawn insight from this area and has been part of a resurgent interest in accounting history since the 1990s in Europe and elsewhere.

Macintosh argues that many of accounting's contemporary problems stem from a crisis of representation, in that there is a widespread loss of faith that language and writing can unproblematically communicate objective truth. As he notes, such queries present immediate problems for a discipline that claims to provide a "fair" or "true and fair" view. He suggests that such a perspective brings us to new problems, moving the discipline away from efforts to create ever more technically involved forms of accounting, which in their complexity and sophistication have paradoxically been seen by many to be ever more divorced from the underlying transactions they seek to represent. Instead, Macintosh suggests new academic questions such as "How do relations of power relate to the truthfulness of accounting regimes of truth and discourse?" and "How do accounting regimes of truth get appropriated as truth perspectives?" (p. 115). In this he leads the reader to the current state of play in interdisciplinary accounting research, where an exploration of the social has led to a questioning of the underpinnings and functioning of accountancy in practice.

In sum, this is an important book, and one that brings together diverse bodies of research in one concise form. Readers looking to acquaint themselves with work beyond the North American mainstream of economics and social psychology would do well to have Norman Macintosh's work as a guide to the insights provided by alternative perspectives.

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REFERENCE

Robson, K. 2004. Accounting, accountants and accountability. *The European Accounting Review* 13 (1): 179–201.

PAUL ROSENFIELD, *Contemporary Issues in Financial Reporting: A User-Oriented Approach* (London, U.K.: Routledge, 2006, ISBN 0-415-70206-2, pp. xxiv, 561).

The latest in the series of "Routledge New Works in Accounting History," this book might be described as a "historical polemic." Its aim is to alert those studying to become CPAs and ultimately the future leaders of their profession that the Generally Accepted Accounting Principles (GAAP) in which they are instructed are far from being "generally accepted": they are the outcome of political and intellectual battles, some fought long ago, and almost all remain highly contestable. The author has been at the heart of many of those battles, his career having included being on the research staff of the AICPA's Accounting Principles Board (APB), and then secretary of the International Accounting Standards Committee (IASC), the predecessor body to today's International Accounting Standards Board (IASB). He drafted the APB's 1970 *Statement on Basic Concepts and Accounting Principles Underlying Financial Statements of Business Enterprises*, a forerunner of the FASB's conceptual framework project.

His major propositions comprise: (1) the problems revealed by Enron, WorldCom, etc., indicate that there are failures not just in the application of GAAP, but in the accounting principles themselves; (2) the major deficiency is a lack of orientation to the needs of users, rather than to those of issuers, auditors, and standard setters; (3) this book sets out how the criteria for financial reporting need re-specifying to recognize the primacy of those user needs; (4) on this basis, the basic measurement principle for all assets should be "current exit value" (and correspondingly for liabilities normally the "current risk-free funding amount" [p. 349]); this gives "current selling price reporting" (CSPR);[1] (5) the likely resulting losses on initial recognition from these amounts being lower (higher) than asset acquisition cost (amounts borrowed/owed) should be presented in a section of the income statement labeled "investments in prospects"; (6) the information users need about the future prospects of the enterprise should be contained in disclosures outside the formal financial statements; (7) as a result of adopting the proposed CSPR basis, almost all traditional arguments about accounting standards—which are largely debates over how to allocate historical acquisition costs over accounting periods (e.g., inventory costing methods; depreciation methods; "full cost" versus "successful efforts" accounting for oil and gas exploration; foreign currency translation [e.g., "temporal" versus "current rate"]) or over how to measure liabilities (e.g., problems of "credit risk" and changes therein, and arguably pension and other post-retirement benefits[2])—simply disappear; (8) CSPR reveals the true volatility of business experience, while traditional accrual accounting attempts to smooth earnings; and (9) as a further corollary, accounting for "intangibles" largely ceases to be a problem—intangibles (and especially goodwill) do not generally have any reliably measurable current selling price and/or are inseparable from the enterprise as a whole, and so any expenditure on acquiring them (as well as on internally generating them) simply needs to be written off against income immediately.

The author engages directly with his readers and other authors throughout by challenging them in the most forthright manner at every turn to evaluate the merits of his arguments, to work out for themselves whether and why they agree or disagree with them, and, indeed, to contact him to continue the debate. In this respect, as Stephen Zeff argues in the Foreword, the book clearly has a valuable role as an adjunct to "the capstone accounting theory or accounting issues course in a professional accounting program ... for enlivening [students'] critical faculties." It should also be required reading for standard setters and their staff, although many of these have, as the author notes, already received drafts of relevant chapters.

There is not space here to argue for or against the author's views. But I have the following criticisms of the structure of the book and of the presentation of the arguments. And in two crucial respects (the nature of "value" and "income") I believe the author fails to address important academic traditions that can do much to explain the apparent anomalies of current practice.

1. **Structure.** Here there are two major faults. First, in a text of 516 pages, the author only fully reveals his preference for CSPR at page 300. Then, having already sternly criticized almost every other idea in accounting, he is surprisingly weak in dealing with the "aggregation" or "unit of account" problem that faces CSPR (or, of course, any accounting system that identifies individual assets and liabilities or classes

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[1] It seems to be consistent with the arguments used, albeit not spelled out precisely, that this amount would be net of transaction costs to sell etc., unlike the FASB's definition of fair value in SFAS No. 157 (which is purely the "price"). However, the author's rejection of the "net of tax" approach to deferred tax accounting at page 441 seems inconsistent here.

[2] This seems to require rejection of actuarial approaches to liability measurement (Chapter 24).

of them): "A person attracted to CSPR on other grounds would believe it's simply a problem to be solved" by standard setters in implementing it. (p. 315). Second, given that most of what primarily interests users (principally stockholders) in financial reporting is "future prospects," which the author regards as residing in the minds of managers and having no place in audited financial statements but rather in supplementary disclosures, the book is disastrously unbalanced. There is only one chapter (of just 18 pages) discussing how these necessary disclosures are to be provided. What, if any, are to be the criteria for standardizing these (cf., Schipper 2007)? And what of their common role as "staging-posts" to eventual full recognition and measurement of controversial items (such as leases) in the financial statements (e.g., Zeff 1988, 22)?

2. **Literature.** While almost every page is peppered with quotations (with which the author usually finds at least one fault), they generally come only from U.S. sources (Chambers and, to some extent, Solomons being the major exceptions) and primarily from the normative tradition that dominated academic accounting until the 1970s. This results in three major omissions. First, there is minimal discussion of "deprival value" (the U.K. Accounting Standards Board's favored measurement basis), which is dismissed in about one page (at pp. 297–298) on the grounds both that it is a version of "current buying price" (when in fact it is a rule for choosing the most relevant of current entry value, exit value, and "value in use" [e.g., Weetman 2007]) and that its income statement effects have not been discussed (ignoring, e.g., Baxter's [1971, 1984] book-length explorations of these issues).[3] Second, the empirical research that now dominates the academic literature and that can shed light on what "users" do in fact find useful (e.g., "value relevance" research) is not addressed. Third, unlike the normative writers he so frequently cites, the author has virtually zero tolerance for economics and for social science generally. This also means that he is cut off from the work in information economics that has influenced much modern research into both user decision-making needs and the likely outcomes of the principal-agent tensions between users (primarily stockholders) and reporting managers; as well as from insights from financial analysis and valuation theory that can illuminate whether and how far CSPR (or "fair values") might be useful to users beyond its currently increasing application to financial instruments (e.g., Penman 2007). He is also cut off from the explorations of how accounting numbers exercise their power—particularly in "performance measurement"—to be found in the more socio-theoretical literatures that have wider currency outside the U.S., especially in Europe (e.g., Hopwood and Miller 1994).
3. **Other issues.** Perhaps the major criticism is that the author's sharp distinction between financial and management accounting (p. 37), which ignores the historical pattern of development from the earliest Industrial Revolution partnerships and owner-managed companies (e.g., Hoskin and Macve 2000) and his apparent distrust of managers as issuers of financial reports to meet users' needs, leads him to ignore what is well known to any auditor: information that is routinely prepared for and used by managers for decision making and control is far more likely reliably to meet the primary user-oriented criteria of "representativeness" and "relevance" (pp. 85–86) than numbers prepared wholly for external purposes and to satisfy externally mandated rules. There are already well-known instances where managers use value-based accountings for both management control and external reporting (e.g., securities traders [Macve and Jackson 1971]; life insurers [Horton et al. 2007][4]). But where is the author's evidence that managers could use CSPR for nonfinancial assets as the basis for running their businesses?

The author is a highly intelligent and articulate exponent of his views on financial accounting and reporting. Unfortunately, he believes that "a mastery of English" should largely suffice to handle the arguments (p. xxiii). But what the students he primarily addresses really need is a good education in the social sciences (including especially economics, comparative law, and history), which he largely dismisses. So, this book can be only an adjunct to, not a substitute for, an accounting theory course. Its style of re-fighting old battles means there is a danger that it may be seen only as a "historical curiosity," when many of its arguments about CSPR are also pertinent to the current, ongoing international debate over both the definition and the usefulness of "fair value"—an international debate whose raging fires SFAS No. 157 has only succeeded in inflaming rather than quenching (e.g., Dealy and Singleton-Green 2007).

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[3] Given that the author spent two years as secretary of the IASC in London in 1973–75, it is strange that he seems unaware of the U.K. literature of that time. Although he cites much (mostly U.S.) academic writing of that era, it is not clear whether he had read it back then or only discovered it more recently.

[4] At page 478, the author dismisses "the never-never land of actuarial work."

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BRIAN A. RUTHERFORD, *Financial Reporting in the UK: A History of the Accounting Standards Committee, 1969–1990* (London, U.K.: Routledge, 2007, ISBN 978-0-415-39421-5, pp. xvii, 438).

Brian Rutherford's history of the U.K.'s Accounting Standards Committee (ASC) is an important contribution to modern accounting history. (The front cover of the book wrongly includes the word "Financial" in the ASC's title, but this is no fault of the author.) As it happens, just a few months earlier another major history was published, of the International Accounting Standards Committee (Camfferman and Zeff 2007). The timing appears to be unrelated, except for the fact that both standard-setting bodies originated in London between 1969 and 1973, and the histories mark their replacement by successor bodies.

Rutherford's Preface sets forth his plan:

> The book provides a historical narrative of the work and achievements of the Accounting Standards Committee from its establishment in December 1969 (when it was known as the Accounting Standards Steering Committee) until it was dissolved in July 1990. The work of standard-setters inevitably involves a degree of conflict with those whose interests are affected by their standards. This can sometimes result in spectacular set-piece battles; in the main, though, the ASC's preferred strategy was the war of attrition. I have endeavoured to capture the flavour of these—less spectacular but sometimes more effective—campaigns as well as the excitement of battle. I have also described something of the more routine work of the standard-setter's daily slog: seeking out useful if uncontentious improvements in financial reporting, keeping pronouncements up to date, and so on. (p. x)

Rutherford is well known in the U.K. in the context of standard setting. He has written several textbooks and many articles on financial reporting, and he is known to believe in using "fair values" to the widest extent possible, but readers of the book would be hard pressed to detect his personal preferences except by following up the occasional citations of his own work. The analysis is balanced and carefully reasoned.

Beginning with the antecedents of formal standards in the U.K. (the advisory *Recommendations on Accounting Principles* published by the Institute of Chartered Accountants in England and Wales [ICAEW] since 1942), the book explains why more formal measures were needed from 1969 onward, responding to financial scandals during the previous decade. The book divides the history into four periods: a "honeymoon" period from 1970 to 1974; a tougher spell from 1975 to 1979; a struggle between 1980 and 1984, mainly in response to the ASC's inability to deal with accounting for changing prices; and a final period of "losing steam" between 1985 and 1990. The complex story of accounting for changing price levels is given two chapters of its own.

Several reporting problems are discussed at length, such as accounting for deferred taxation, property depreciation, and intercompany investments. In each case, the nature of the problem is outlined, and the history presented of the processes by which an accounting standard was achieved, after exposure drafts had been aired and conflicting views accommodated. Rutherford generally assumes some level of familiarity with accounting principles, although a concise review of the alternative treatments is provided. The book would be intelligible to an undergraduate who has taken no more than introductory and intermediate accounting classes.

At several points, there are references to the impact upon U.K. accounting standards of U.S. practices and institutions, for example, the interaction between the U.K. and U.S. arms of the Big 8 firms—later to become the Big 6 and now Big 4 (p. 17). In the context of particular problems, U.S. standards are compared with U.K. equivalents, e.g., for purchase versus pooling of interests (known in the U.K. as "acquisition and merger" accounting) (pp. 66–67), foreign currency translation (p. 178), and pension costs (pp. 255–257). The search for a conceptual framework also presented similar problems in both countries (pp. 107, 111).

Rutherford's final chapter reviews what was technically and politically feasible for the ASC over its life. He is at his best when tracing the conflicts that hampered agreement over exposure drafts. However, he overlooks Moonitz's 1974 study of what made Accounting Principles Board standards acceptable in the U.S., distinguishing among the resolution of minor choices between practical alternatives, the treatment of new problems, and standards that affected the "bottom line" reported income. Only where reported income was affected, Moonitz argued, did serious controversy arise. By contrast, Rutherford tends to explain the ASC's successes and failures in terms of the personalities involved.

Rutherford was a Council member of one of the six professional bodies that commented upon standards and then adopted them to guide its members. The body (now known as the Association of Chartered Certified Accountants, [ACCA]) had severe disagreements with the largest U.K. body, the ICAEW, which appeared to want to dominate the ASC. Rutherford's accounts of the disagreements are scrupulous and revealing (reflecting his interviews with many people closely involved). He frankly notes when the ACCA seemed petulant and inconsistent, and also when it seemed justified.

U.K. accounting standards have always differed from their U.S. counterparts. For one thing, they generally apply to the financial statements of all registered companies, and not merely to those of companies listed on stock markets. U.K. company law from the mid-19th century required all companies to prepare financial statements, and for much of the time to publish balance sheets yearly. But the law set out only disclosure headings, without specifying how the figures were to be prepared. This was left to accountants. When the need appeared for more uniformity in practice, the ICAEW took the initiative in the early 1940s of drawing up its *Recommendations*, but the authority of these documents was unclear. The U.K. tradition was at that time, as it has continued to be since, to set out principles for application rather than precise legal rules (a tradition that the IASC sought to maintain, as has the International Accounting Standards Board since 2001).

When the ASC began to issue Statements of Standard Accounting Practice, they were enforceable only upon U.K. accountants to the extent that the accountants' professional body was prepared to exert disciplinary pressure. The subject matter scarcely ever figured in cases brought before the courts. The (six major) U.K. professional bodies rarely regarded a departure from a standard to be a disciplinary matter. But this is not to say that standards were ineffectual. Accountants were usually grateful for guidance on how to deal with practical issues like the effects of taxation, or research and development costs. Moreover, the financial press used extant standards as criteria for judging financial reports. Controversy generally followed when standards impinged on reported profits, as Moonitz argued in the U.S.

It was widely felt to strengthen U.K. standards that they had to be persuasive, upon the accountancy bodies and upon boards of directors. This conferred a sense of ownership that would be lacking if standards were issued, say, by civil servants backed by the force of law. But Rutherford's book shows, on the contrary, that the ASC suffered excessively from its lack of authority. He was himself for a time a staff member of the IASC, although the book makes no mention of this. He knows how much time and energy is burned up persuading reluctant accountants to agree a standard. (The IASC's problem was even greater than the ASC's, because legal enforcement was a matter for the diverse countries that adopted the standards.)

This is an absorbing, interesting, and well-written book, effectively addressing the relevant technical, political, and institutional issues. To a great extent, it meets the author's objective, to "capture the flavour" of the campaigns and to show how the ASC operated. A few other authors have reflected on the processes of standard setting (including, for example, Edward Stamp's caustic 1985 reflections). Rutherford's book is well informed, citing abundant original interview material as well as archival sources. It is also accurate, free from bias, and comprehensive. It conforms, in other words, to just those characteristics that a good set of financial statements should display.

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CAPSULE COMMENTARIES

By the Book Review Editor

LAURIE A. BARFITT, *The Contributions of John Lansing Carey to the Profession of Accountancy* (Oxford, U.K.: Elsevier, 2007, ISBN 978-0-7623-1394-5, pp. xi, 236).

This is the 10th in a series entitled *Studies in the Development of Accounting Thought*, edited by Robert J. Bricker and Gary Previts. The author completed the manuscript as a Ph.D. dissertation done at the University of Mississippi, supervised by a committee chaired by Dale L. Flesher. The result is an earnest and admiring biography of John L. Carey, who was the chief administrative officer of the American Institute of Accountants, renamed in 1957 as the American Institute of Certified Public Accountants, from 1930 to his retirement in 1969. For 17 years, he also edited *The Journal of Accountancy*. Jack Carey *was* the Institute during all of that long tenure.

The manuscript is replete with 17 tables and 5 graphs, plus many excerpts from Carey's extensive writings, as well as a list of books and articles written by Carey. By any standard, it is a thorough work. Yet the author says nothing about Carey's cold reception in 1936 of the American Accounting Association's pioneering statement on accounting principles, as it trespassed on the Institute's turf. Carey was slow to recognize the role that the Institute might play on the world stage, but the author does not discuss Carey's thinking on international developments.

Unlike most published doctoral dissertations, this work contains a useful index. The book is recommended to those interested in the evolution of the Institute and of the U.S. public accounting profession until the 1960s.

Towards Convergence: A Survey of IFRS to US GAAP Differences (London, U.K.: Ernst & Young, 2007, pp. 144).

This useful volume reports on company experiences with Form 20-F reconciliations of IFRS to U.S. GAAP filed by 130 SEC foreign private issuers for fiscal years ending between December 31, 2005 and March 31, 2006. The firm identifies "almost 200 reported IFRS to U.S. GAAP differences in this survey with companies' reported results still significantly impacted by differences between the [FASB's and IASB's] frameworks."

Alternative treatments available under IFRS but not under U.S. GAAP led to fairly widespread differences under IAS No. 23, on borrowing costs; IAS No. 19, on employee benefits; IAS No. 31, on interests in joint ventures; and on IAS No. 16, on property, plant, and equipment. Approximately one-third of the companies in the survey reported differences for IAS Nos. 23 and 19. Interestingly, only 10 percent of the surveyed companies reported a difference under IAS No. 16 because of having chosen the revaluation option under IFRS.

The extracts from financial statement footnotes are presented for 28 financial reporting topics, and extracts and statistical analyses are given for seven industry sectors.

The publication may be downloaded from Ernst & Young's website at: http://www.ey.com/global/content.nsf/UK/US_Capital_Markets.

Editorial Data

The following table contains information about turnaround time for manuscripts (including revisions) on which editorial decisions were made in the 12-month period ended December 31, 2006. Turnaround time is the number of days between the date that the manuscript was received *and the date of the editor's letter to the author(s).*

	Number of Manuscripts	Percent	Cumulative Number	Cumulative Percent
0 ≤ Days ≤ 30	68	16.23	68	16.23
31 ≤ Days ≤ 60	173	41.29	241	50.96
61 ≤ Days ≤ 90	110	26.25	351	83.77
91 ≤ Days ≤ 120	52	12.41	403	96.18
121 ≤ Days	16	3.82	419	100.00
Total	419	100.00		

The mean review time was 58.66; the median review time was 56 days.

New Submissions by calendar year (January 1 to December 31)

1992	241
1993	234
1994	231
1995	195
1996	230
1997	195
1998	196
1999	239
2000	260
2001	260*
2002	324
2003	327
2004	307
2005	389
2006	413

* 2001—in addition to the 260 regular submissions, 68 MSs were submitted to the *TAR* Quality of Earnings Conference.

The acceptance rate (defined as number of MSs accepted divided by the number of new submissions) over the past 5 years is between 12–16% per year.

EDITORIAL POLICY AND STYLE INFORMATION

EDITORIAL POLICY

According to the policies set by the Publications Committee (which were endorsed by the Executive Committee and were published in the *Accounting Education News*, June 1987), *The Accounting Review* "should be viewed as the premier journal for publishing articles reporting the results of accounting research and explaining and illustrating related research methodology. The scope of acceptable articles should embrace any research methodology and any accounting-related subject, as long as the articles meet the standards established for publication in the journal ... No special sections should be necessary. The primary, but not exclusive, audience should be—as it is now—academicians, graduate students, and others interested in accounting research."

The primary criterion for publication in *The Accounting Review* is the significance of the contribution an article makes to the literature.

The efficiency and effectiveness of the editorial review process is critically dependent upon the actions of both authors submitting papers and the reviewers. Authors accept the responsibility of preparing research papers at a level suitable for evaluation by independent reviewers. Such preparation, therefore, should include subjecting the manuscript to critique by colleagues and others and revising it accordingly prior to submission. The review process is not to be used as a means of obtaining feedback at early stages of developing the research.

Reviewers and associate editors are responsible for providing critically constructive and prompt evaluations of submitted research papers based on the significance of their contribution and on the rigor of analysis and presentation. Associate editors also make editorial recommendations to the editor.

MANUSCRIPT PREPARATION AND STYLE

The Accounting Review's manuscript preparation guidelines follow *The Chicago Manual of Style* (15th ed.; University of Chicago Press). Another helpful guide to usage and style is *The Elements of Style*, by William Strunk, Jr., and E. B. White (Macmillan). Spelling follows *Webster's Collegiate Dictionary.*

FORMAT

1. All manuscripts should be printed in 12-point font on one side of 8½ × 11" good quality paper and be double-spaced, except for indented quotations.
2. Manuscripts should be as concise as the subject and research method permit, generally not to exceed 7,000 words.
3. Margins of at least one inch from top, bottom, and sides should facilitate editing and duplication.
4. To promote anonymous review, authors should not identify themselves directly or indirectly in their papers or in experimental test instruments included with the submission. Single authors should not use the editorial "we."
5. A cover page should show the title of the paper, the author's name, title and affiliation, email address, any acknowledgments, and a footnote indicating whether the author would be willing to share the data (see last paragraph in this statement).

Pagination: All pages, including tables, appendices and references, should be serially numbered. Major sections should be numbered in Roman numerals. Subsections should not be numbered.

Numbers: Spell out numbers from one to ten, except when used in tables and lists, and when used with mathematical, statistical, scientific, or technical units and quantities, such as distances, weights and measures. For example: *three days; 3 kilometers; 30 years*. All other numbers are expressed numerically.

Percentages and Decimal Fractions: In nontechnical copy use the word percent in the text.

Hyphens: Use a hyphen to join unit modifiers or to clarify usage. For example: *a well-presented analysis; re-form*. See *Webster's* for correct usage.

Keywords: The abstract is to be followed by four keywords that will assist in indexing the paper.

ABSTRACT/INTRODUCTION

An Abstract of about 100 words should be presented on a separate page immediately preceding the text. The Abstract should concisely inform the reader of the manuscript's topic, its methods, and its findings. Keywords and the Data Availability statements should follow the Abstract. The text of the paper should start with a section labeled "I. Introduction," which provides more details about the paper's purpose, motivation, methodology, and findings. Both the Abstract and the Introduction should be relatively nontechnical, yet clear enough for an informed reader to understand the manuscript's contribution. The manuscript's title, but neither the author's name nor other identification designations, should appear on the Abstract page.

TABLES AND FIGURES

The author should note the following general requirements:

1. Each table and figure (graphic) should appear on a separate page and should be placed at the end of the text. Each should bear an Arabic number and a complete title indicating the exact contents of the table or figure. Tables and figures should define each variable. The titles and definitions should be sufficiently detailed to enable the reader to interpret the tables and figures without reference to the text.
2. A reference to each graphic should be made in the text.
3. The author should indicate by marginal notation where each graphic should be inserted in the text.
4. Graphics should be reasonably interpreted without reference to the text.
5. Source lines and notes should be included as necessary.

Equations: Equations should be numbered in parentheses flush with the right-hand margin.

DOCUMENTATION

Citations: Within-text citations are made using an author-year format. Cited works must correspond to the list of works listed in the "References" section. Authors should make an effort to include the relevant page numbers in the within-text citations.

1. In the text, works are cited as follows: author's last name and year, without comma, in parentheses. For example: one author, (Berry 2003); two authors, (Fehr and Schmidt 2003); three or more authors, (Dechow et al. 1998); more than one work cited, (Cole and Yakushiji 1984; Dechow et al. 1995; Levitt 1998); with two works by the same author(s), (Nelson 2003, 2005).
2. Unless confusion would result, do not use "p." or "pp." before page numbers. For example, (Dechow and Dichev 2002, 41–42).
3. For cited works that include more than one work by an author (or same co-authors) that are published in the same year, the suffix a, b, etc., is to follow the date in the within-text citations and in the "References" section. For example: (Baiman and Rajan 2002a, 2002b).
4. When the author's name is mentioned in the text, it need not be repeated in the citation. For example: "Cohen et al. (2005) provide ..."
5. Citations to institutional works should use acronyms or short titles where practicable. For example: (NCFFR, The Treadway Commission 1987).
6. If the paper refers to statutes, legal treatises, or court cases, citations acceptable in law reviews should be used.

Reference List: Every manuscript must include a "References" section that contains only those works cited within the text. Each entry should contain all information necessary for unambiguous identification of the published work. Use the following formats (which follow *The Chicago Manual of Style*):

1. Arrange citations in *alphabetical order* according to the surname of the first author or the name of the institution or body responsible for the published work.
2. Arrange citations in *chronological order* when two or more works are by the same first author (regardless of co-authors). Two or more works by the *same author(s)* published in the same year are distinguished by letters a, b, etc., after the year.
3. Use authors' initials instead of proper names.
4. For two or more authors, separate authors with a comma, including a comma before "and" (Dechow, P. M., R. Sloan, and A. Sweeney).
5. Date of publication follows the author's (authors') name(s).
6. Titles of journals or newspapers should not be abbreviated.

Sample entries are as follows:

Baiman, S., and M. Rajan. 2002a. The role of information and opportunism in the choice of buyer-supplier relationships. *Journal of Accounting Research* 40 (2): 247–278.

———, and ———. 2002b. Incentive issues in inter-firm relationships. *Accounting, Organizations and Society* 27 (3): 213–238.

Berry, R. 2003. Testimony before the Senate Committee on Homeland Security and Governmental Affairs Permanent Subcommittee on Investigations. November 18. Available at: http://hsgac.senate.gov/_files/111803berry.pdf.

Cohen, D., A. Dey, and T. Lys. 2005. The Sarbanes Oxley Act of 2002: Implications for compensation structure and risk-taking incentives of CEOs. Working paper, New York University, University of Chicago, and Northwestern University.

Cole, R., and T. Yakushiji, eds. 1984. *The American and Japanese Auto Industries in Transition.* Ann Arbor, MI: University of Michigan.

Dechow, P. M., R. Sloan, and A. Sweeney. 1995. Detecting earnings management. *The Accounting Review* 70 (2): 193–225.

———, S. P. Kothari, and R. L. Watts. 1998. The relation between earnings and cash flows. *Journal of Accounting and Economics* 25: 133–168.

———, and I. Dichev. 2002. The quality of accruals and earnings: The role of accrual estimation errors, *The Accounting Review* 77 (Supplement): 35–59.

Easton, P. 2003. Discussion of: The predictive value of expenses excluded from pro forma earnings. *Review of Accounting Studies* 8: 175–183.

Engel, E., R. Hayes, and X. Wang. 2007. The Sarbanes-Oxley Act and firms' going-private decisions. *Journal of Accounting and Economics* (forthcoming).

Financial Accounting Standards Board (FASB). 2006. *Accounting for Uncertainty in Income Taxes, and Interpretation of FASB Statement No. 109.* FASB Interpretation No. 48. Financial Accounting Series. Norwalk, CT: FASB.

Fehr, E., and K. Schmidt. 2003. A theory of fairness, competition, and cooperation. In *Advances in Behavioral Economics,* edited by C. Camerer, G. Loewenstein, and M. Rabin, 271–296. New York, NY: Princeton University Press.

Janis, I. L. 1982. *Groupthink: Psychological Studies of Policy Decisions and Fiascoes.* Boston, MA: Houghton Mifflin.

Levitt, A. 1998. The numbers game. Speech delivered at New York University, Center for Law and Business, September 28.

Maggi, G. 1999. The value of commitment with imperfect observability and private information. *RAND Journal of Economics* (Winter) 30: 555–574.

National Commission on Fraudulent Reporting (the Treadway Commission). 1987. *Report of the National Commission on Fraudulent Financial Reporting.* Washington, D.C.: NCFFR.

Nelson, M. W. 2003. Behavioral evidence on the effects of principles- and rules-based standards. *Accounting Horizons* 17 (1): 91–104.

———. 2005. A review of experimental and archival conflicts-of-interest research in auditing. In *Conflicts of Interest: Challenges and Solutions in Business, Law, Medicine, and Public Policy,* edited by D. A. Moore, D. M. Cain, G. Loewenstein, and M. H. Bazerman. Cambridge, U.K.: Cambridge University Press.

Rigdon, E. E., R. E. Schumacker, and W. Wothke. 1998. A comparative review of interaction and nonlinear modeling. In *Interaction and Nonlinear Effects in Structural Equation Modeling,* edited by R. E. Schumacker, and G. A. Marcoulides, 1–16. Mahwah, NJ: Erlbaum Associates.

Schultz, E., and T. Francis. 2002. Companies profit on workers' deaths through "dead peasants" insurance. *Wall Street Journal* (April 19): 1.

Securities and Exchange Commission (SEC). 2002. *Certification of Disclosure in Companies' Quarterly and Annual Reports.* Release Nos. 33-8124, 34-46427. Washington, D.C.: SEC.

U.S. House of Representatives. 2002. The Sarbanes-Oxley Act of 2002. Public Law 107-204 [H. R. 3763]. Washington, D.C.: Government Printing Office.

Footnotes: Footnotes are not used for documentation. Textual footnotes should be used only for extensions and useful excursions of information that if included in the body of the text might disrupt its continuity. Footnotes should be consecutively numbered throughout the manuscript with superscript Arabic numerals. Footnote text should be doubled-spaced and placed at the end of the article.

SUBMISSION OF MANUSCRIPTS

Authors should note the following guidelines for submitting manuscripts:

1. Manuscripts currently under consideration by another journal or publisher should not be submitted. The author must state that the work is not submitted or published elsewhere.
2. For manuscripts reporting on field surveys or experiments: If the additional documentation (e.g., questionnaire, case, interview schedule) is sent as a separate file, then all information that might identify the author(s) must be deleted from the instrument.
3. MS should be submitted via email as Microsoft® Word or PDF files to the *TAR* office at TARUAZ@email.arizona.edu. A submission letter, a separate cover page, and the MS containing no author identification should be emailed as separate files. The submission fee should be paid online (VISA or MasterCard only) at: https://aaahq.org/AAAforms/journals/tarsubmit.cfm. If unable to pay online, a check in U.S. funds, made payable to the American Accounting Association, may be sent to Professor Dan Dhaliwal, Senior Editor, *The Accounting Review*, The University of Arizona, Department of Accounting, McClelland Hall 301, 1130 E. Helen Street, Tucson, AZ 85721-0108. The submission fee in U.S. funds is $125.00 for members and $200.00 for nonmembers of the AAA. Effective January 1990, the submission fee is nonrefundable.
4. The author should retain a copy of the paper.
5. Revisions must be submitted within 12 months from request, otherwise they will be considered new submissions.

COMMENTS

Comments on articles previously published in *The Accounting Review* will be reviewed (anonymously) by two reviewers in sequence. The first reviewer will be the author of the original article being subjected to critique. If substance permits, a suitably revised comment will be sent to a second reviewer to determine its publishability in *The Accounting Review*. If a comment is accepted for publication, the original author will be invited to reply. All other editorial requirements, as enumerated above, also apply to proposed comments.

POLICY ON REPRODUCTION

An objective of *The Accounting Review* is to promote the wide dissemination of the results of systematic scholarly inquiries into the broad field of accounting.

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Written application must be made to the American Accounting Association, 5717 Bessie Drive, Sarasota, FL 34233-2399, for permission to reproduce any of the contents of the *Review* for use in other than courses of instruction—e.g., inclusion in books of readings or in any other publications intended for general distribution. In consideration for the grant of permission by the *Review* in such instances, the applicant must notify the author(s) in writing of the intended use to be made of each reproduction. Normally, the *Review* will not assess a charge for the waiver of copyright.

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POLICY ON DATA AVAILABILITY

The following policy has been adopted by the Executive Committee in its April 1989 meeting. "An objective of (*The Accounting Review, Accounting Horizons, Issues in Accounting Education*) is to provide the widest possible dissemination of knowledge based on systematic scholarly inquiries into accounting as a field of professional research, and educational activity. As part of this process, authors are encouraged to make their data available for use by others in extending or replicating results reported in their articles. Authors of articles which report data dependent results should footnote the status of data availability and, when pertinent, this should be accompanied by information on how the data may be obtained."

JANUARY 2008 PLACEMENT ADS

*The deadline for information to be included in the "Placement Information" section is two months prior to the date of publication. The **Review** is published in January, March, May, July, and October. Placement advertising and replies should be sent to the American Accounting Association, 5717 Bessie Drive, Sarasota, FL 34233-2399, ATTENTION: ADVERTISING DEPT. All replies to box numbers should be on separate sheets to facilitate forwarding.*

101 COLUMBIA UNIVERSITY Business School seeks applications for faculty positions in Accounting. Rank is open. Appointment at senior rank requires outstanding record of scholarship. Candidates with an interest in Financial Accounting research will be preferred. We are looking for an outstanding person with evidence of a strong commitment to both teaching and research. Candidates should possess a doctoral degree or be close to completion. We offer a highly supportive research environment and easy interaction with faculty in other disciplines. Salary and benefits are competitive. Please send resume, an unpublished research paper, and letter(s) of recommendation to: Professor Doron Nissim, Columbia University Business School, 604 Uris Hall, 3022 Broadway, New York, NY 10027. Columbia University is an Equal Opportunity, Affirmative Action employer. Women and minorities are especially encouraged to apply. Deadline: January 31, 2008.

102 UNIVERSITY OF MICHIGAN, Ross School of Business has tenure-track positions available in Accounting starting in the 2008 academic year. Candidates with research and teaching interests in all areas of accounting will be considered. Faculty positions at all ranks are available. The application should include a research paper, which may be based on the candidate's dissertation, evidence of teaching experience (if any), and a *curriculum vitae* that includes three references. Applications should be sent by mail only to: Ms. Pamela Russell, Stephen M. Ross School of Business, University of Michigan, Room W7738, 701 Tappan Street, Ann Arbor, MI 48109-1234. The University of Michigan offers competitive salary and fringe benefits and is an affirmative action/non-discriminatory employer.

103 SAN FRANCISCO STATE UNIVERSITY has one tenure-track faculty opening in Systems/Cost at the rank of Assistant Professor and one tenure-track faculty opening in Taxation at the rank of Assistant/Associate Professor. The appointment date is Fall 2008. Candidates should have a doctoral degree by August 1, 2008 with a strong commitment to scholarly research and teaching excellence. Professional experience or certification is desirable. The Department of Accounting offers concentrations in Accounting for B.S., M.B.A., and M.S.B.A. degrees. The College of Business is AACSB-accredited. A letter of application, *curriculum vitae*, three recent letters of recommendation, and any additional materials that support the application (teaching evaluations, samples of publications, etc) should be sent to: Dr. Kenneth Danko, College of Business, Accounting Search, San Francisco State University, 1600 Holloway Avenue, San Francisco, CA 94132. Applications accepted until positions are filled. SFSU is an Affirmative Action/Equal Opportunity Employer.

104 INDIANA UNIVERSITY, Department of Accounting invites applications for a Clinical Assistant/Associate Professor position effective Fall 2008. Clinical faculty hold full-time positions. They focus efforts on teaching, direct supervision of student activities, mentoring, and other forms of instruction. They should bring considerable executive-level work experience and an advanced degree desirable into the classroom as an important part of the instructional mission of the University. The teaching load is nine credit hours per semester. After a probationary period, clinical faculty may be appointed with a renewable long-term contract. Interested candidates send a current *vita* and a letter of interest to: Joe Fisher, Chair, 1309 E. 10th Street, Bloomington, IN 47405-1701; Email: jofisher@indiana.edu. Deadline: January 15, 2008.

105 INDIANA UNIVERSITY, Department of Accounting invites applications for tenure-track faculty positions at the Assistant/Associate Professor rank effective Fall 2008. Candidates must possess a doctoral degree and have a strong commitment to excellence in scholarly research and teaching. Compensation levels are competitive and negotiable. Interested candidates should send a current *vita*, a research paper suitable for presentation at a workshop, and evidence of teaching ability to the contact person indicated below. Three letters of reference will also be required before an offer of employment can be considered. Contact address: Joe Fisher, Chair, Department of Accounting, 1309 E. 10th Street, Bloomington, IN 47405-1701; Email: jofisher@indiana.edu. Applications received before January 1, 2008 will be given full consideration.

106 INDIANA UNIVERSITY, Department of Accounting, invites applications for a tenure-track faculty position effective Fall 2008. Preference will be given to Assistant Professors with teaching and research interests in auditing, but individuals at Associate level are welcome to apply. Candidates must possess a Ph.D. and a strong commitment to excellence in scholarly research and teaching. Compensation levels are competitive and negotiable. Interested candidates should send a current *vita*, a research paper, and evidence of teaching ability. Three letters of reference will also be required before an offer of employment can be considered. Contact address: Joe Fisher, Chair, 1309 E. 10th Street, Bloomington, IN 47405-1701; Phone: (812) 855-3705; Email: jofisher@indiana.edu. Applications received before January 1, 2008 will be given full consideration.

107 CENTRAL MICHIGAN UNIVERSITY, College of Business Administration, is accepting applications for a tenure-track Assistant/Associate Professor position in accounting starting in August 2008. Principal responsibilities include teaching undergraduate and graduate courses in accounting. Normal teaching load is nine credit hours per semester. Required: A doctorate from an AACSB-accredited school with a major in Accounting, or ABD in the final stages of dissertation completion; evidence of teaching excellence in accounting courses at the university level; and a strong research agenda. Preferred: A professional certification (CPA, CMA, CIA) and evidence of online course development and delivery. Please mail application letter, resume, and three references to: Dr. Philip Kintzele, Chair, School of Accounting, Central Michigan University, 312 Grawn Hall, Mt. Pleasant, Michigan 48859; Phone: (989) 774-3796; Fax: (989) 774-3999. For full job announcement, see http://www.fps.cmich.edu/jobs. CMU, an AA/EO institution, strongly and actively strives to increase diversity within its community (see http://www.cmich.edu/aaeo/).

108 JOHN CARROLL UNIVERSITY, Department of Accountancy invites applications for a tenure-track position beginning in the Fall 2008 term, pending funding. All ranks will be considered. A Ph.D. from an AACSB-accredited institution (or advanced stage ABD) is required; professional accounting certification (e.g., CPA) is preferred. We seek someone who can teach AIS but the knowledge and background to teach various accountancy courses is an advantage. Our mission requires us to consider only dynamic candidates who are both productive scholarly researchers and excellent classroom teachers; evidence of each is required for consideration. Faculty also participate in the life of the university by advising students and serving on committees. Candidates should send a letter of application with their *curriculum vita* and three letters of reference to: Dr. Gerald Weinstein, Boler School of Business, 20700 North Park Boulevard, University Heights, OH 44118; Phone: (216) 397-4609; Email: weinstein@jcu.edu. Applications will be accepted until the position is filled. We are an Affirmative Action/Equal Opportunity Employer, committed to diversity in the workplace, and strongly encourage applications from women and minorities.

109 OREGON STATE UNIVERSITY, Assistant Professor, tenure-track position. Required qualifications include (1) an appropriate earned doctorate from an AACSB-accredited university with an emphasis in accounting; (2) a record of significant evidence of potential for research and scholarly publication and teaching effectiveness. Primary teaching responsibilities involve delivering undergraduate and graduate courses in two of the following areas: auditing, financial, or managerial accounting. For full consideration apply online by 10/31/07. For more information contact Cheryl Hoflich. Email: Hoflichc@bus.oregonstate.edu; or Phone: (541) 737-4276. To review posting and apply, go to http://jobs.oregonstate.edu/applicants/Central?quickFind=51803. OSU is an AA/EOE.

110 UNIVERSITY OF NORTH CAROLINA, Asheville Management and Accountancy Department invites applications for a tenure-track Accounting position, to begin Fall 2008. Rank and salary will be determined according to degree and level of teaching experience. Candidates should possess a doctorate in Accounting, although ABD status will be considered. Preference for professional certification. Candidates should be current in knowledge of GAAP, Sarbanes-Oxley, and related professional and governmental developments. Teaching requirements include Intermediate/ Advanced Accounting or Systems/Auditing. Candidates must demonstrate excellent teaching skills and an ability to perform research in the discipline. Standard faculty workload is an equivalent of 12 hours per semester. Candidates should send current *vita*, statement of teaching philosophy, three references, and evidence of teaching ability to: Dr. Bryan Schaffer, Recruitment Chair UNCA, Management and Accountancy, One University Heights, CPO#1850, Asheville, NC 28804-8507. Application review begins immediately. UNCA is a liberal arts university and an Affirmative Action/Equal Opportunity Employer.

111 UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE invites applications for the Jule and Marguerite Surtman Distinguished Professorship in Business Ethics, beginning August 2008. The Surtman Professor will have a joint appointment in the Belk College (tenure home) and in the Philosophy Department in the College of Arts and Sciences. He/she also will be a Senior Associate of the Center for Professional and Applied Ethics. Please visit the university's website (http://www.uncc.edu) for more information on the University of North Carolina at Charlotte, the Belk College of Business, the Philosophy Department, and the Center for Professional and Applied Ethics. Application: Only electronic submissions will be accepted. Interested individuals should complete an online application at: https://jobs.uncc.edu, and attach the following documents: (1) application letter; (2) a current and complete *vita*; and (3) names, addresses (including titles and institutions), telephone numbers, and email addresses of three references.

112 UNIVERSITY OF NORTH CAROLINA AT WILMINGTON, Cameron School of Business, Department of Accountancy and Business Law, invites applications for a tenure-track position at the Assistant or Associate level in the area of Accounting Information Systems beginning Fall 2008. The ability to teach in other areas is preferred. Ph.D. in Accounting or Management Information Systems/Computer Science with a background in accounting and a record of commitment to quality teaching and research is required. ABDs will be considered if completed by 8/1/08. For more information and to apply, please visit http://consensus.uncw.edu. UNCW is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

113 YOUNGSTOWN STATE UNIVERSITY, Williamson College of Business Administration (WCBA) is seeking tenure-track faculty members, at the Assistant or Associate level, who will be active in building the accounting major through teaching, publication in refereed accounting journals, and service. The department of accounting has faculty needs in multiple areas. Qualifications: Ph.D. or ABD in accounting from an AACSB-accredited institution. Teaching experience and professional certification in accounting preferred; rank and salary commensurate with experience and qualifications. Send letter of application, *vitae*, names of three references (along with complete contact information), statement of teaching interest and qualifications, and teaching evaluations (if available) to: Dr. Joe Antenucci, Chair, Department of Accounting and Finance, WCBA, Youngstown State University, One University Plaza, Youngstown, OH 44555-0001. Alternatively, application materials can be sent via email to: jwantenucci@ysu.edu. YSU is an Affirmative Action/Equal Opportunity Employer Committed to Increasing the Diversity of its Faculty, Staff, and Students

114 STATE UNIVERSITY OF NEW YORK AT FREDONIA seeks candidates for a tenure-track Assistant Professor position beginning Fall 2008. Position involves teaching various undergraduate accounting courses. Successful candidates will have a Ph.D./D.B.A. in Accounting by the time the position starts, and show strong commitment to teaching excellence. Review of applications begins September 15 and will continue until position is filled. Provide letter of application (please indicate the position you are applying for and where you saw this ad), resume, three recent letters of reference, evidence of teaching effectiveness, an example of scholarly work, and photocopies of official transcripts of graduate coursework to: Dr. Linda Hall, Chair, Accounting Search Committee, Department of Business Administration, School of Business, E336 Thompson Hall, State University of New York at Fredonia, Fredonia, NY 14063; Fax: (716) 673-3332; Email: Linda.Hall@fredonia.edu. An Affirmative Action/Equal Opportunity Employer, SUNY at Fredonia encourages and actively seeks applications from minorities, women, and people with disabilities. SUNY at Fredonia prides itself on an outstanding workforce. To continually support organizational excellence, the university conducts background screens on applicants.

115 UNIVERSITY OF KENTUCKY, Von Allmen School of Accountancy, in the Gatton College of Business and Economics, invites applications for two full-time positions. Qualifications: earned doctorate in accounting; high-quality academic research record (Full: archival area; Associate: open); continuing research agenda; being an integral part of the accounting Ph.D. program; effective teaching ability. Teaching area(s) can be customized from: Financial, Managerial, or Governmental Accounting; Accounting Information Systems; Forensic Accounting/Auditing; Internal/External Auditing; and Financial Statement Analysis. Accredited by AACSB. Send letter of interest by October 5, 2007 with resume, three references, sample of teaching evaluations, and copies of current working papers: Linda McDaniel, Professor of Accountancy, The Von Allmen School of Accountancy, Gatton College of Business and Economics, University of Kentucky, Lexington, KY 40506-0034. Confidential inquiries: David A. Ziebart, Director, Von Allmen School of Accountancy, (859) 257-2112. Start: Fall 2008 (negotiable). Open until filled. UK is an EOE.

116 UNIVERSITY OF NORTH CAROLINA AT WILMINGTON, Cameron School of Business, Department of Accountancy and Business Law, invites applications for a tenure-track position at the Assistant or Associate level in the area of Accounting Information Systems beginning Fall 2008. The ability to teach in other areas is preferred. Ph.D. in Accounting or Management Information Systems/Computer Science with a background in accounting is preferred, but ABDs will be considered. A record of commitment to quality teaching and research is required. Please apply online at: http://consensus.uncw.edu. Three letters of reference are required. If questions contact: Daniel Ivancevich,,Search Committee Chair, at: ivancevichd@uncw.edu or (910) 962-7681. Application review to start on 10/15/07. UNCW is AACSB-accredited and an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply. Visit: http://www.csb.uncw.edu/departments/acgbl/index.stm.

117 WASHINGTON UNIVERSITY, Olin Business School is seeking faculty in accounting at all levels beginning in August 2008. We seek persons with the commitment and demonstrable ability to be outstanding scholars and effective teachers. Candidates for Assistant Professor should have their doctoral dissertation completed or near completion. Candidates for Associate Professor should have an established record of quality research. Candidates for Full Professor should have a substantial record of scholarship and an international reputation. Salary, teaching load, and faculty support are highly competitive. Applicants should send a cover letter, *curriculum vitae*, and a copy of the dissertation proposal or completed dissertation, or in the case of more established scholars, several samples of the applicant's scholarship. Applications should be sent to: Dean Mahendra R. Gupta, Olin Business School, Campus Box 1133, Washington University, One Brookings Drive, St. Louis, MO 63130-4899. Early applications receive fullest consideration. Washington University is an Equal Opportunity/Affirmative Action Employer and welcomes applications from women and minorities.

118 MONTANA STATE UNIVERSITY–BOZEMAN seeks applications for an Accounting tenure-track position starting Spring 2008 or Fall 2008. All ranks considered. Applicant's teaching preference should be at least one of the following: governmental, information systems, auditing, forensic accounting, managerial or financial. Completed or anticipated Ph.D./D.B.A. (Accounting emphasis) from an AACSB-accredited university is required. Applicants must exhibit potential for teaching excellence, capacity to publish quality research, and a commitment to service. Applications should include a letter of interest, *curriculum vitae*, statement of teaching philosophy, evidence of teaching excellence, research interest statement, and contact information for three references. Electronic submission to: accountingsearch@montana.edu is encouraged. Signed, hard copy of the letter of interest is required if submitted electronically. Applications may also be sent to: Dr. Marc Giullian, PO Box 173040, MSU–Bozeman, MT 59717-3040. Application review begins after September 4, 2007. Contact: Dr. Giullian. Email: mgiullian@montana.edu; Phone (406) 994-1965, or visit http://www.montana.edu/msuinfo/jobs/faculty/. ADA/AA/EO/Veteran's Preference.

119 UNIVERSITY OF WISCONSIN–WHITEWATER, Accounting Department, anticipates an opening for a full-time, tenure-track position for Fall 2008. The minimum qualification is an earned terminal degree (Ph.D. or D.B.A.) in accounting or a related area, although ABD may be considered. Preferred qualifications include (1) the ability to teach Taxation, Financial or Cost/Managerial Accounting, (2) professional certification (e.g., CPA or CMA), and (3) interest in developing courses in a nontraditional format (e.g., online). Responsibilities include teaching undergraduate and/or graduate accounting courses along with research/scholarly activities, advising, and service. Salary is competitive and negotiable. Review of applications will begin October 15, 2007, and continue until the position is filled. All interested persons should apply in writing to: Dr. Robert Gruber, Department of Accounting, C5019A, University of Wisconsin–Whitewater, 800 West Main Street, Whitewater, WI 53190-1790. The University of Wisconsin–Whitewater is an Affirmative Action/Equal Opportunity Employer.

120 EAST TENNESSEE STATE UNIVERSITY, College of Business and Technology, Department of Accountancy. Assistant/Associate Professor, tenure-track position. Position Contingent upon state funding. East Tennessee State University, College of Business and Technology, Department of Accountancy, invites applications for a tenure-track position in Accountancy beginning Fall 2008. All ranks considered. Salary package is competitive. Essential Functions: Teaching undergraduate and graduate courses, engaging in scholarly activities and providing service to the department and college. Current teaching load is nine hours per semester. Qualifications: Ph.D. in accounting is required. ABDs near completion will be considered. Preference may be given to those with an interest in auditing/information systems. Review of applications will begin immediate and continue until the position is filled. Send an ETSU application and current *vitae* with references to: Dr. Gary Burkette, Ph.D., Chair, Department of Accountancy, ETSU, Box 70710, Johnson City, TN 37614; Email: burkette@etsu.edu. AA/EOE. Minorities, people with disabilities and women are encouraged to apply.

121 SALEM STATE COLLEGE, Bertolon School of Business is seeking to fill two tenure-track position in Accounting or Finance (1–Accounting and Finance) (1–Information Systems) for the Fall of 2008. Teaching load is 12 hours. The position is advertised pending funding. Required qualifications include a Ph.D. in Accounting or Finance. We prefer candidates with experience in and commitment to teaching in a multiracial, multiethnic environment with students of diverse backgrounds and learning styles, as well as in distance learning and instructional technologies, and candidates who enjoy serving as role models and mentors for a diverse student body. The salary is competitive and commensurate with education and experience. Application review will begin in the Fall 2007 and continue until an adequate pool is developed. To apply, complete an application online at: https://jobs.salemstate.edu, search by department Accounting and Finance.

122 UNIVERSITY OF NORTH TEXAS invites applications and nominations for the position of Chairperson, Department of Accounting, beginning Spring/Fall 2008. The chairperson is responsible for providing academic, administrative, and professional leadership for the department. The position includes limited teaching responsibilities. The department chairperson reports to the Senior Associate Dean of the College of Business Administration. The University of North Texas is an emerging national research institution located in the vibrant and rapidly expanding Dallas-Fort Worth metropolitan area and situated in close proximity to DFW International Airport. University enrollment is over 33,000 students with more than 6,500 graduate students. Accounting programs are offered at the undergraduate, master's, and doctoral levels. Review of applications will begin immediately and continue until the position is filled. Each application should include a letter of interest; professional resume; and the names, addresses, and telephone numbers of three references. Applications and nominations should be sent to: Dr. Teresa Conover, Search Committee Chair, Department of Accounting, University of North Texas, PO Box 305219, Denton, TX 76203-5219, or submitted electronically to: naudei@unt.edu. The University of North Texas is an Equal Opportunity Employer. Women and minorities are encouraged to apply.

123 UNIVERSITY OF MASSACHUSETTS AMHERST, Department of Accounting invites applications for two tenure-track positions as Assistant/Associate Professor of Accounting. All research areas will be considered. Start date is September 2008. All candidates should have a doctoral degree and a strong commitment to scholarly research and excellence in teaching. The department has a continuing commitment to enhance the diversity of its faculty, student body, and curriculum. Salary is competitive. Please send *c.v.*, contact information for three references, and copies of research papers or publications to: Professor James F. Smith, Chair, Search Committee, Department of Accounting and Information Systems, Isenberg School of Management, University of Massachusetts Amherst, 121 Presidents Drive, Amherst, MA 01003. Deadline for applications is November 15, 2007 but applications will be accepted until successful candidates are found. The University of Massachusetts Amherst is an Affirmative Action/Equal Opportunity Employer.

124 UNIVERSITY OF TENNESSEE AT MARTIN invites applications for a tenure-track position in Accounting. An earned doctorate (ABD considered) from an AACSB-accredited institution is required. Professional certification is desirable. Responsibilities include undergraduate and graduate teaching, research, and outreach activities. While all areas of specialization will be considered, preference will be given to those with an interest in Auditing, Financial, or Accounting Information Systems. Learn more at: http://www.utm.edu/departments/cbpa.

125 THE GEORGE WASHINGTON UNIVERSITY, Accountancy Department invites applications for two, tenured/tenure-track, open rank positions, to begin Fall 2008. Applicants for Associate or Full Professor rank must have a Ph.D., a distinguished research record, an excellent teaching record, and continuing interest in research and guiding junior faculty. A qualified candidate may be awarded the Benjamin Franklin Chair. Applicants for Assistant Professor rank should have a Ph.D. by August 1, 2008. ABDs are considered as instructors and must complete the degree by August 1, 2009. The successful candidate will have a strong commitment for scholarly research and teaching excellence. Tenure, rank, and salary commensurate with qualifications. Application procedure: Send an application letter, resume, and current working papers to: Keith Smith, Accountancy Chair, The George Washington School of Business, Email: accyjob@gwu.edu. Only complete applications are considered. Application review begins November 1, 2007 and continues until positions are filled. George Washington is an EO/AA employer.

126 DALTON STATE COLLEGE is recruiting a tenure-track Assistant/Associate or Visiting Professor to teach undergraduate accounting courses beginning Spring or Fall 2008. Standard teaching load is three courses per semester. A Ph.D. in accounting is required with professional certification and relevant work experience preferred. Applicants must be able to demonstrate a commitment to both teaching and research, and be academically qualified in accordance with AACSB standards. DSC is located along I-75 between Atlanta and Chattanooga. Diverse housing options include mountain, waterfront, urban, and suburban settings. The Division of Business equally respects and encourages pedagogical, applied, and basic research. We characterize ourselves as a teaching college with a collegial faculty that values work-life balance. Interested persons should submit a letter of application, *vitae*, statement of teaching philosophy, three references, and transcripts to: Dr. Cassie Bradley, Division of Business Administration, Dalton State College, 650 College Drive, Dalton, GA 30720; Email: cbradley@daltonstate.edu. DSC is an EEO/AA Employer.

127 UNIVERSITY OF NEW HAMPSHIRE, Whittemore School of Business and Economics invites applications for two tenure-track positions in accounting at the Assistant Professor level beginning Fall 2008. Applicants must have a doctoral degree or be near completion. Teaching interests in auditing, managerial accounting and/or accounting information systems are preferred, however candidates with interests in other areas will be considered. Faculty members are expected to publish in peer-reviewed journals. Salary and fringe benefits are competitive and the school subscribes to various financial databases through WRDS. Interested applicants should mail a packet containing a letter of interest, current *vita*, three recommendation letters, recent teaching evaluations, and evidence of scholarly work to: Professor Catherine Plante, Box A, McConnell Hall, University of New Hampshire, Durham, NH 03824; Phone: (603) 862-3384. The School is accredited by the AACSB and is an Affirmative Action/Equal Opportunity Employer with a commitment to excellence through diversity.

128 FLORIDA INTERNATIONAL UNIVERSITY, (FIU) School of Accounting invites applications for tenure-track, clinical, and visiting positions at all ranks and areas. Preference will be given to candidates with a Ph.D. However, individuals with an LLM (Taxation) and ABDs are encouraged to apply. Applications from minority candidates are also encouraged. Expectations include strong commitment to excellence in graduate and undergraduate teaching, research and service. The School of Accounting is separately accredited by the AACSB and offers B.Acc., M.Acc., M.S.T., and Ph.D programs. FIU is a Carnegie Doctoral Research-Extensive (Research-I) institution with diverse student body including both full time residential students as well as commuters and enrollments in excess of 38,000 students. To apply, send a *vita* and names of five references to: Ana Estevill, Florida International University, School of Accounting, 11200 SW 8th St., RB 239, University Park, Miami, FL 33199; Email: estevill@fiu.edu. FIU is an Equal Opportunity Employer.

129 THE UNIVERSITY OF TEXAS AT SAN ANTONIO invites applications for one or more positions at the Assistant, Associate, or Professor levels beginning August 2008, pending budget approval. Responsibilities may include teaching undergraduate, masters, and/or Ph.D. courses. Applications from faculty interested in all areas of teaching and research in accounting are welcome to apply. Preference will be given to applicants with a teaching area in taxation or information systems/computer auditing and/or who have worked closely with Ph.D. students. Applicants must submit a letter of application for a specific rank, evidence of teaching, and research excellence, a *vita*, and the names and contact addresses of three references to: Dr. Marshall Pitman, Search Committee Chair; Email marshall.pitman@utsa.edu. Applicants who are selected for interviews must be able to show proof that they are eligible and qualified to work in the United States. For details concerning specific requirements please consult the full text of the position announcement at http://business.utsa.edu/jobs or email Dr. Pitman. UTSA is an Affirmative Action/Equal Employment Opportunity Employer. Women, minorities, veterans and individuals with disabilities are encouraged to apply.

130 SHIPPENSBURG UNIVERSITY seeks candidates for the position(s) of Assistant Professor of Accounting, effective January or August 2008. Earned Ph.D. in Accounting or D.B.A. from an AACSB institution is preferred. Committee will consider an ABD in an AACSB-accredited Accounting program and may be willing to consider applicants with an earned doctorate in a related discipline if that applicant has a CPA or CMA certification with a demonstrated research interest in Accounting. Position(s) requires effective teaching, publishable research, service, and strong communication skills. Send a written letter of application, current *curriculum vitae*, undergraduate and graduate transcripts (unofficial at application, official prior to interview), and contact information for three references to: Dr. Scott N. Cairns, John L. Grove College of Business, Shippensburg University, 1871 Old Main Drive, Shippensburg, PA 17247-2299. Review of applications begins November 1, 2007. Shippensburg is an Equal Opportunity Employer. See http://www.ship.edu/HR/index.html for additional requirements and qualifications.

131 UNIVERSITY OF MAINE, the Maine Business School invites applications for a tenure-track Assistant or Associate Professor in Accounting Fall 2008. The area of specialization is open. Applicants should have or anticipate completion of an appropriate doctoral degree in Accounting by Fall 2008. Commitment to teaching, a quality research program, and significant service are required. For details about the position see: http://www.umaine.edu/eo/jobs/faculty.htm. For more information about the Maine Business School, see: http://www.umaine.edu/business. Send a letter of application, *c.v.*, three letters of reference, a sample publication or research paper, and evidence of teaching effectiveness to: Professor Steven Colburn, Chair Search Committee, Maine Business School, University of Maine, 5723 DP Corbett Business Building, Orono, Maine 04469-5723: Email: Colburn@maine.edu: Phone: (207) 581-1982. Review of applications will begin immediately and will continue until the position is filled. Position is contingent upon funding. UM is an EO/AA Employer.

132 KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY, (KAIST) Accounting Area at the Department of Business Economics invites applications for new tenure-track faculty positions in Accounting at all ranks in any areas of specialization beginning Fall 2008. Applicants should possess a doctorate or be close to completion. We offer competitive salaries, research support, teaching loads, and excellent fringe benefits compared to top research schools. Send application before Dececmber 15, 2007, including dissertation proposal or working paper, *vita*, and three letters of reference to: Wonjoon Kim, Assistant Professor, KAIST, Business Economics, 383-1 Guseong-dong, Yusoeng-gu, Daejeon 305-701, (South) Korea. Late applications accepted until position is filled.

133 WASHINGTON & LEE UNIVERSITY, Department of Accounting invites applications for a tenure-track position at the Assistant Professor level, beginning Fall 2008. Teaching responsibilities will include upper-level courses in financial accounting and introductory courses in financial and managerial. Applicants should have a doctorate from an AACSB-accredited institution, or be close to completion. Evidence or promise of high-quality teaching and scholarship is expected. Washington & Lee is a small, highly-selective, private university, located in the scenic Shenandoah Valley, and is ranked fifteenth in the *US News & World Report* list of best national liberal arts colleges. The Williams School of Commerce, Economics, and Politics has been AACSB-accredited since 1927. Interested parties should send a cover letter, *curriculum vitae*, evidence of teaching effectiveness, and research papers to: Scott Boylan, Department of Accounting, Washington & Lee University, Lexington, Virginia 24450; Email: boylans@wlu.edu. Review of applications will begin immediately and will continue until the position is filled. Washington & Lee is an Equal Opportunity/Affirmative Action Employer.

134 UNIVERSITY OF PENNSYLVANIA invites applications for positions available July 2008 in Financial, Managerial, and Tax Accounting at all academic ranks. A Ph.D. or expected completion by June 30, 2009 is required. Demonstrated ability or potential for high-quality research and teaching are important. Interested persons should send *vitae* including education, professional experience, publications, personal data, and, if applicable, a dissertation proposal and abstract to: Professor John Core, Accounting Department, University of Pennsylvania, Suite 1300 Steinberg-Dietrich Hall, Philadelphia, PA 19104-6365. The deadline for applications is January 15, 2008. The University of Pennsylvania values diversity and seeks talented students, faculty, and staff from diverse backgrounds. The University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer. Women, minority candidates, veterans, and individuals with disabilities are strongly encouraged to apply.

135 UNIVERSITY OF OKLAHOMA, the Steed School of Accounting has a faculty opening for the academic year 2008–2009 at the rank of Assistant Professor. Candidates must possess an appropriate doctorate or be near completion. Candidates must demonstrate potential for research by their doctoral dissertation, publications and working papers. Salary and fringe benefits: Competitive commensurate with rank and experience. Anticipated appointment date: August 15, 2008. All qualified individuals are encouraged to submit application materials to: Professor Frances L. Ayres Steed School of Accounting Price College of Business Administration The University of Oklahoma Norman, OK 73019-4004; Email: fayres@ou.edu; Phone: (405) 325 5768; Fax: (405) 325 7348. Applications will be accepted until the position is filled. The University of Oklahoma is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

136 UNIVERSITY OF WATERLOO invites applications for tenured or tenure-track positions in Accounting beginning 2008, especially from applicants with teaching interests in auditing, financial reporting, or tax. Rank and field are open. Candidates should have a Ph.D. or expect to complete one in 2008, should demonstrate high-quality research and teaching or the potential for both, and should have interest in contributing to our Ph.D. program. For details about our faculty and programs, please visit: http://accounting.uwaterloo.ca/. To apply, please send a *curriculum vitae* and research sample, preferably electronically. In addition, three referees should send letters directly to: lola@uwaterloo.ca. Alternatively, send paper applications to: The Director, c/o Lori Laronde, School of Accounting and Finance, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada. The University of Waterloo encourages applications from all qualified individuals, including women, members of visible minorities, native peoples, and persons with disabilities. Canadian citizens and permanent residents receive priority.

137 THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, Kenan-Flagler Business School is seeking to hire one or more faculty members for a full-time, tenured, tenure-track, or fixed-term position in the Accounting Area. Applicants should be able to teach in at least one of the following areas: financial accounting and managerial accounting. Applicants should have a Ph.D. with an emphasis in accounting and a demonstrated commitment to research. Applicants should have teaching experience as well as significant research accomplishments. All applicants should be able to contribute to the University's teaching mission at the undergraduate, Master of Accounting, M.B.A., Ph.D., and Executive Education levels. Interested individuals should email, attaching *curriculum vitae*, a sample of research papers, and four letters of recommendation to: AccountingRecruiting@unc.edu. The University of North Carolina at Chapel Hill is an Equal Opportunity Employer. http://areas.kenan-flagler.unc.edu/Accounting/Pages/default.aspx.

138 THE UNIVERSITY OF TEXAS AT DALLAS invites applications for a faculty position in Accounting, effective September 2008. Appointment at Assistant, Associate, or Full Professor level will be considered. Appointees must have (or expect) a Ph.D. or equivalent and demonstrate the ability to conduct a nationally recognized research program. Applicants should send a complete *curriculum vitae* and names and addresses of three references to: Academic Search #40137, The University of Texas at Dallas, PO Box 830688, M/S AD 42, Richardson, TX 75083-0688. Indication of sex and ethnicity are requested as part of the application, but not required. UTD is an AA/EOE. For more information, visit http://www.som.utdallas.edu/aim.

139 AMERICAN UNIVERSITY IN CAIRO, Department of Management invites applications for faculty positions in accounting. Position # MGMT-1-08. Ph.D. is required. A Ph.D. from an AACSB-accredited university is preferred. Teaching/industry experience, professional certification, and recent scholarly research and publications preferred. Appointment at all levels, including visiting appointments, will be considered. One- two- or three-year appointments, subject to mutual agreement will begin September 2008. Renewal of an appointment depends upon institutional needs and/or the appointee's performance. Salary and rank are according to scale based on qualifications and professional experience. For expatriates, benefits include housing, annual round-trip air travel for appointee and qualifying dependents, plus schooling for the equivalent of up to two children at Cairo American College. For complete details and application information: http://aucegypt.interviewexchange.com. For more information visit our website at: http://www.aucegypt.edu. EOE.

140 NORTHERN KENTUCKY UNIVERSITY invites applications for the position of Chair of the Department of Accountancy beginning July 2008. Candidates should possess a Ph.D./D.B.A. in Accounting from an AACSB-accredited school, skills needed to effectively interact with the accounting profession and the business community, as well as a record of scholarship, teaching excellence, service, and outreach commensurate with appointment as a tenured Associate or Full Professor of Accounting. The ideal candidate has knowledge of and experience with AACSB accounting accreditation standards. Professional certification is also desirable. The College of Business is AACSB-accredited and salary and benefits are AACSB competitive. For more information, see our website: http://cob.nku.edu/accountancy. Review of applications will begin immediately and continue until the position is filled. Each application should include a letter of interest, resume, and contact information for three references. Send applications to: Search Committee, Department of Accountancy BEP 469, College of Business, Northern Kentucky University, Highland Heights, KY 41099; or submit electronic applications to: brossartan@nku.edu. Northern Kentucky University is an Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply.

141 UNIVERSITY OF NEVADA, LAS VEGAS, College of Business, an AACSB-accredited college at both undergraduate and graduate levels, invites applications for Assistant Professors in Accounting to start Fall 2008. The first position requires a primary interest in auditing and/or financial accounting. The second position requires a primary interest in accounting information systems. Both involve teaching at the undergraduate and graduate levels, conducting significant research leading to high-quality refereed publications, and performing service activities. Candidates must have a strong academic record and have demonstrated potential for excellence in both research and teaching. A doctoral degree in accounting from an AACSB-accredited school is required, but ABDs near completion will be considered. Salary competitive, contingent on labor market. This position is contingent upon funding. Application details may be obtained by visiting http://hr.unlv.edu/Jobs. UNLV is an Equal Opportunity/Affirmative Action Employer committed to excellence through diversity.

142 UNIVERSITY OF MISSOURI–KANSAS CITY invites applications and nominations for the position of Chair, Department of Accountancy and Helen Kemper/Missouri Professorship in Accounting. Candidates should have a record of achievement in teaching and research to warrant a tenured appointment at the rank of Full Professor, an earned doctorate, relevant business experience, and evidence of an ability to operate effectively in a participative, collegial environment. Candidates at the Associate or Full Professor level will be considered; previous administrative experience and professional certification are desirable. A starting date of August 2008 is desired. Application should include a statement describing the candidate's ability to meet stated qualifications for the position, a *curriculum vitae,* and the names and contact information of at least three references. Submit applications to: Homer Erekson, Dean, Henry W. Bloch School of Business and Public Administration, University of Missouri–Kansas City, 5100 Rockhill Road, Kansas City, MO 64110-2499: Email: ereksonh@umkc.edu: Phone: (816) 235-2204. The review of applications will begin immediately and will continue until the position is filled. UMKC is an Equal Opportunity/Affirmative Action Employer. Women and minority candidates are strongly encouraged to apply. For more details see http://www.umkc.edu/html/acjobs/bloch.html.

143 UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN invites applications for Director, Master of Science in Accountancy (M.S.A.) Program. This position will be responsible for directing the overall administration of the M.S.A. program, including, but not limited to, marketing, recruiting, admissions, professional development, field trips, and social activities, and alumni relations for the M.S.A. program. A complete job description is located at: http://www.business.uiuc.edu/accountancy/msadirector.html. This is a full-time academic professional position without tenure. Closing date is January 31, 2008. Contact: accy@uiuc.edu. or Department of Accountancy, University of Illinois at Urbana-Champaign, 360 Wohlers Hall, 1206 S. Sixth Street, Champaign, IL 61820. Phone 217-333-0857. The University of Illinois is an Affirmative Action /Equal Opportunity Employer.

144 THE UNIVERSITY OF TEXAS AT ARLINGTON, Department of Accounting invites applications for tenure-track positions at the Assistant Professor rank in all areas of accounting to begin August 2008. Applicants must be close to completion or have an appropriate doctoral degree at the time of joining the faculty. All applicants are expected to have a commitment to quality research demonstrated by publishing in nationally recognized "A" journals, teaching excellence, and academic/professional service. All areas of expertise will be considered. The College of Business and Department of Accounting are both AACSB-accredited. Review of applications will begin immediately, and continue until the position is filled. A complete resume, working paper, and three reference letters should be sent to: The University of Texas at Arlington, Department of Accounting, Chandra Subramaniam, Search Committee Chair, Box 19468, Arlington, TX 76019. This is a security sensitive position, and a criminal background check will be conducted on all finalists. The University of Texas at Arlington is an Equal Opportunity/Affirmative Action Employer.

145 SOUTHERN CONNECTICUT UNIVERSITY, Department of Accounting invites applications for an Associate or Assistant Professor. Position #1 Specialization(s): Tax (Graduate and Undergraduate levels), and Introductory Financial and Managerial Accounting. Brief Description of Duties/ Responsibilities: Preference will be given to candidates who can teach tax at both graduate and undergraduate levels, with additional teaching responsibilities in introductory accounting courses. Additional responsibilities include productive service and scholarly activities. Required Qualifications: Ph.D. or D.B.A. in Accounting or ABD nearing completion; L.L.M. with accounting degree will also be considered. Preferred Qualifications: Earned Ph.D./Terminal Degree in Accounting/Taxation. Some evidence of scholarly/creative activity. Position #2 Specialization(s): Auditing and Accounting Information Systems (graduate and undergraduate levels), and Introductory Financial and Managerial Accounting. Brief Description of Duties/Responsibilities: Preference will be given to candidates who can teach Auditing and Accounting Information Systems at both graduate and undergraduate levels, with additional teaching responsibilities in Introductory Financial and Managerial Accounting courses. Additional responsibilities include productive service to the department, the business school, the university, and scholarly activities. Required Qualifications: Earned Ph.D./Terminal degree in Accounting/Accounting Information Systems. Some evidence of scholarly/creative activity. Application Process: Candidates should submit letter of application, current *curriculum vita*, and three letters of recommendation to: Chair, Search Committee, Department of Accounting, Southern CT State University, 501 Crescent Street, New Haven, CT 06515. Screening begins December 7, 2007 and continues until the positions are filled. SCSU is an Affirmative Action/Equal Opportunity Employer and strongly encourages women and minority groups to apply.

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146 CALIFORNIA STATE UNIVERSITY, EAST BAY invites applications for tenure-track, open rank position in accounting to begin Fall 2008. The position is for teaching and conducting research in the area of accounting especially in Auditing. A candidate must expect to have an earned doctorate in Accounting from an AACSB-accredited institution no later than the date of appointment. The candidate must demonstrate teaching excellence. A research program or research interest in designated areas is highly desirable as well as professional or business experience. Review of applications will begin September 1, 2007 and will continue until the position is filled. Please send a letter of application, current *vita*, teaching evaluations, and three letters of recommendation to: Dr. Christopher Lubwama, Chair, Department of Accounting and Finance, California State University, East Bay, 25800 Carlos Bee Boulevard, Hayward, CA 94542; Phone (510) 885-3397. CSUEB is an Equal Opportunity Employer committed to diversity.

147 CALIFORNIA STATE UNIVERSITY, EAST BAY invites applications for tenure-track, open rank position in accounting to begin Fall 2008. The position is for teaching and conducting research in the area of accounting especially in Taxation. A candidate must expect to have an earned doctorate in Accounting from an AACSB-accredited institution no later than the date of appointment. The candidate must demonstrate teaching excellence. A research program or research interest in designated areas is highly desirable as well as professional or business experience. Review of applications will begin September 1, 2007 and will continue until the position is filled. Please send a letter of application, current *vita*, teaching evaluations, and three letters of recommendation to: Dr. Christopher Lubwama, Chair, Department of Accounting and Finance, California State University, East Bay, 25800 Carlos Bee Boulevard, Hayward, CA 94542; Phone (510) 885-3397. CSUEB is an Equal Opportunity Employer committed to diversity.

148 UNIVERSITY OF MASSACHUSETTS BOSTON invites applications for two tenure-track positions in Accounting beginning Fall 2008. Candidates with primary interests in financial accounting and taxation are desired; however, candidates in all areas of interest are encouraged to apply. A Ph.D. in Accounting is required (degree must be in hand no later than 8/31/08). Applicants should send a cover letter, *curriculum vitae*, names of three references and research sample to: Chair, Accounting Recruiting Committee, Search 695e, Department of Accounting and Finance, College of Management, University of Massachusetts Boston, 100 Morrissey Boulevard, Boston, MA 02125-3393. UMass Boston is an Affirmative Action/Equal Opportunity/Title IX Employer.

149 THE COLLEGE OF NEW JERSEY, Department of Accounting invites applications for tenure-track Assistant or Associate Professors. Will teach introductory Accounting classes and teach and develop curriculum in tax and fraud-forensic Accounting. An earned Master/Doctorate required; Accounting Ph.D., professional experience, CPA, CFE, and other professional certifications are pluses. ABDs considered, but appointment conditional on completion of doctoral work by 08/08. A commitment to undergraduate education, participation developing interdisciplinary programs, and high-quality research expected. The College of New Jersey is and outstanding public college with exceptional students. The School of Business offers an AACSB-accredited business program to ~1,000 undergraduates. Our beautiful suburban campus is easily accessible to NYC and Philadelphia. Please submit *vita*, teaching philosophy statement, evidence of quality teaching, graduate transcripts, recent writing samples, and names of references to: Chair, Accounting Search Committee, School of Business, TCNJ, PO Box 7718, Ewing, NJ 08628-0718. We are an EO/AA employer, committed to attracting talented candidates from underrepresented groups.

150 MCGILL UNIVERSITY, Desautels Faculty of Management invites applications in all areas of accounting at the Associate or Full Professor level. Candidates must have a Ph.D. and should have a proven research and teaching record. Located in downtown Montreal, McGill University is one of Canada's leading research universities and is well-known for its academic excellence. Applicants should send their *curriculum vitae* January 15th, 2008, three letters of recommendation and recent publications/working papers to: Ms. Linda Foster Administrative Assistant, Accounting Area, Desautels Faculty of Management, McGill University, 1001 Sherbrooke St., West Montreal, Quebec H3A 1G5 Canada. In accordance with Canadian Immigration requirements, priority considerations will be given to Canadian citizens or permanent residents but all qualified candidates are encouraged to apply. McGill is strongly committed to diversity in employment and welcomes applications from visible minority group members, women, members of sexual minority groups, and persons with disabilities.

151 MCGILL UNIVERSITY, Desautels Faculty of Management invites applications in all areas of accounting at the Associate or Full Professor level. Candidates must have a Ph.D. and should have a proven research and teaching record. Located in downtown Montreal, McGill University is one of Canada's leading research universities and is well-known for its academic excellence. Applicants should send their *curriculum vitae* January 15th, 2008, three letters of recommendation and recent publications/working papers to: Ms. Linda Foster Administrative Assistant, Accounting Area, Desautels Faculty of Management, McGill University, 1001 Sherbrooke St., West Montreal, Quebec H3A 1G5 Canada. In accordance with Canadian Immigration requirements, priority considerations will be given to Canadian citizens or permanent residents but all qualified candidates are encouraged to apply. McGill is strongly committed to diversity in employment and welcomes applications from visible minority group members, women, members of sexual minority groups and persons with disabilities.

152 ELON UNIVERSITY, Martha and Spencer Love School of Business invites applications for three tenure-track Assistant or Associate Professors (visiting appointments available). The School is accredited by AACSB. These positions are the result of growth. Applicants should demonstrate an interest in teaching at the undergraduate, graduate, and executive level, provide evidence of effective undergraduate teaching, have an interest in mentoring students, and have an established research agenda. Preference will be shown to candidates who possess a Ph.D. or ABDs who will complete their degree by August 2008. Review of candidates begins immediately. To apply, send a letter of interest, *curriculum vita*, and list of three references to: Professor Art Cassill, Chair, Department of Accounting and Finance, Martha and Spencer Love School of Business, 100 Campus Drive, Campus Box 2075, Elon, NC 27244; Email: acassill@elon.edu. Elon University (http://www.elon.edu) is an EEO Employer committed to a diverse faculty, staff, and student body.

153 UNIVERSITY OF ILLINOIS AT CHICAGO, Accounting Department invites applications for one or more tenure-track faculty positions beginning August 2008. The rank of the position(s) is open. Tax is an area of interest. At the Assistant Professor level, Ph.D., completed or near completion, strong potential for quality research and teaching is expected. At the Associate or Full Professor level, Ph.D. and an excellent record of teaching and research consistent with a senior-level appointment is expected. Visit our website for further information @ http://www.uic.edu/cba/. This search will remain open until the position(s) is filled. For full consideration, submit a letter of interest, *c.v.*, representative publications, and references to: James Pierce, Accounting Search, CBA Academic Affairs (M/C 075), 2202 University Hall, 601 S. Morgan St, Chicago, IL 60607-7124 by January 15, 2008. For information about this position, contact Peter Chalos, Department Head at: pchalos@uic.edu. UIC is an AA/EOE.

154 UNIVERSITY AT ALBANY, Department of Accounting invites applications for one tenure-track position at the Assistant Professor level starting September 2008. The candidates should have a doctoral degree in accounting or be ABD with expected completion by December 2008, and have strong teaching and research interests in auditing, assurance, and/or forensics-related areas. The degree(s) must be from a college or university accredited by a U.S. Department of Education or internationally recognized accrediting organization. Candidates with doctoral degrees in allied disciplines such as Economics, Computer Science, Statistics, and Criminal Justice are also strongly encouraged to apply. Certifications/licenses such as CPA, CIA, and CISA and experience in practice are preferred. Evidence of a strong commitment to scholarly research and excellence in teaching, and a demonstrated ability to work with and/or instruct diverse groups of people is required. Salary is competitive. Starting date is September 1, 2008. Review of applications will begin November 26, 2007 and continue until the position is filled. Candidates are requested to submit *vitae* and contacts for three references by email to: Jagdish S. Gangolly, Accounting Search Chair Department of Accounting and Law, School of Business, University at Albany, 1400 Washington Avenue-BA 361A, Albany, New York 12222; Email: jgangolly@uamail.albany.edu.

155 UNIVERSITY OF MINNESOTA, Department of Accounting, Carlson School of Management invites applications for a position as an Associate or Full Professor of accounting, rank depending upon qualifications and experience, and consistent with Carlson School and University policy. Applicants must have demonstrated excellence in teaching and an established record of publications in top-tier academic journals commensurate with the rank they are seeking. Review of applications begins November 1, 2007 and will continue until the position is filled. Applications must include a *curriculum vita*, two samples of recent research papers, and evidence of teaching quality. In addition, applicants will be required to apply online at: https://employment.umn.edu, search for posting #151484. Candidates must possess a doctoral degree. Initial consideration of all applications will be conducted confidentially. Applications should be sent to: Recruiting Chair, Department of Accounting, 3-122 Carlson School of Management, 321 19th Avenue, South Minneapolis, MN 55455. Finalists will be asked to provide references. The University of Minnesota is an Equal Opportunity Educator and Employer.

156 TENNESSEE TECHNOLOGICAL UNIVERSITY invites applications for a full-time, tenure-track position at the level of Assistant or Associate Professor to begin in August 2008. The successful candidate will have a doctorate or ABD nearing completion from an AACSB institution, excellent communication skills, interest in publishing in peer-reviewed journals and willingness to teach in online programs. The department and college are both accredited by AACSB. Contact: Dr. Larry Maples, Chair Search Committee, Box 5024, TTU, Cookeville, TN 38505; Email: lmaples@tntech.edu. For complete position summary and application requirements, see: http://www.tntech.edu/jobs. Screening begins January 15, 2008, position open until filled. AA/EEO.

157 THE CHINESE UNIVERSITY OF HONG KONG, School of Accountancy: Professor(s)/Associate Professor(s)/Assistant Professor(s)/Visiting Scholar(s) (Ref. 07/236(020)/2). Applicants should have (1) a Ph.D. degree (or close to completion); and (2) strong commitment to scholarly research and teaching. Appointees will teach in the areas of financial accounting, management accounting, auditing, taxation, and/or accounting information system. Appointments will normally be made on contract basis for one to three years, initially commencing August 2008, leading to longer-term appointment or substantiation later subject to mutual agreement. Applications will be accepted until the posts are filled. For application, please send full resume, copies of academic credentials, a publication list and/or abstracts of selected published papers, and contacts of three referees to: Professor T. J. Wong, Director, School of Accountancy, The Chinese University of Hong Kong, Shatin, Hong Kong; Email: tjwong@cuhk.edu.hk. More details are available at: http://www.cuhk.edu.hk/personnel.

158 NICHOLLS STATE UNIVERSITY invites nominations and applications for the Arlen B. Cenac Endowed Chair in Accounting in the College of Business Administration at Nicholls State University. Further information and application instructions can be found at: http://www.nicholls.edu/hr/opportunities.htm.

159 WAYNE STATE UNIVERSITY invites applications for a tenure-track position at the Assistant Professor level beginning August 2008 to teach undergraduate and graduate (M.S.A. and M.B.A.) courses primarily in managerial accounting. Candidates must possess an earned doctoral degree in Accounting from an AACSB-accredited school. The School actively encourages applications from women and minority persons. Salary will be commensurate with qualifications and experience. WSU is a Carnegie Research Doctoral Extensive University located in Detroit, Michigan, with current enrollment of approximately 33,000, approximately 2,700 undergraduate and 1,200 graduate business school students. Qualified candidates should submit their application packages electronically via our secure website at: http://jobs.wayne.edu, position number 034622 in the Department of Accounting in the School of Business Administration. WSU is an Equal Opportunity/Affirmative Action Employer.

160 UNIVERSITY OF TEXAS–PAN AMERICAN, Department of Accounting and Business Law in the College of Business Administration invites applications for two tenure-track faculty positions (Assistant/Associate). For more information please visit http://www.utpa.edu/humanresources/employment. This position is security-sensitive as defined by the Texas Education Code § (c) and Texas Government Code§411.094 (a) (2). Texas law requires faculty members whose primary language is not English to demonstrate proficiency in English. Send a letter of application and a complete resume to: Chair, Search Committee, Department of Accounting and Business, Law College of Business Administration, The University of Texas–Pan American, 1201 West University Drive, Edinburg, TX 78539-2999. Applications may also be sent via email to: leale@utpa.edu. For additional information call (956) 381-3384. Review of applications will begin immediately; position open until filled. UTPA is an AA/EO employer. Women, minorities and persons with disabilities are encouraged to apply.

161 CONCORDIA UNIVERSITY located in beautiful Montreal, Quebec, Canada, invites applications for tenure-track positions in Accountancy at the rank of Assistant, Associate or Full Professor, effective June 1, 2008. A doctoral degree (completed or near completion) in Accountancy is required. Salaries are competitive and commensurate with qualifications and experience. These positions are subject to budgetary approval. The Department of Accountancy is one of five departments at the John Molson School of Business (AACSB-accredited), has nearly 30 full-time faculty members, is one of the largest in the country, and has an established record of excellence in accounting education and academic research. Please send your complete application package in hard copy by February 1, 2008 to: Dr. Dominic Peltier-Rivest, Chairman, Department of Accountancy, John Molson School of Business, Concordia University, 1455 de Maisonneuve Blvd. West, Montreal, Quebec H3G 1M8 Canada; Email: drivest@jmsb.concordia.ca. Concordia has a policy of employment equity, including affirmative action for women faculty. In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada.

162 YALE UNIVERSITY, School of Management is seeking additional faculty members at the junior level in the area of accounting. Ph.D. or equivalent is required; research and teaching interest in both theory and application preferred, as well as an interdisciplinary orientation. Appointments will be made for the 2008–2009 academic year. To apply online visit: http://mba.yale.edu/faculty/openings.htm. Please note that the Yale School of Management will only be accepting electronic applications. Please visit the website for instructions on how to submit letters of recommendation electronically. The deadlines for receipt of all materials is: January 15, 2008. Yale is an Equal Opportunity/Affirmative Action Employer and especially encourages applications from women and members of minority groups.

163 LINGNAN UNIVERSITY, a distinctive liberal arts institution in Hong Kong, is inviting applications for the position of Associate Professor/Assistant Professor/Visiting Scholar (Ref.: 07/134/TAR) in the Department of Accountancy, tenable from mid-August 2008. The Department is committed to producing graduates with a broad-based liberal arts education featuring the latest theoretical and practical knowledge to face the challenge of the accounting profession in an increasingly complex business environment. The appointee should have a Ph.D. degree with relevant teaching experience and be able to teach in at least two of the following areas: Financial Accounting, Managerial Accounting, Accounting Information Systems, and Corporate Governance (Accounting/Auditing aspects). Recognized professional accountancy qualifications and demonstrated research strength will be a plus. Appointments may also be made on a visiting basis at all ranks on a shorter-term contract. Review of applications will begin in November/December 2007. Details of the post and application procedure are available at: http://www.ln.edu.hk/info/about/employment/index.shtml.

164 TEXAS A&M UNIVERSITY, Department of Accounting, Mays Business School invites applications for an anticipated position beginning in August 2008. This position is open to rank and area of specialization. Applicants should have a doctoral degree in accounting and should have a strong commitment to scholarly research and teaching excellence. Please send a cover letter and resume that includes: (1) educational achievement; (2) research/publication record; (3) indicators of teaching activity/effectiveness of potential; (4) work and other experience; and (5) a list of three references with addresses and phone numbers. All applications should be directed to: James Benjamin, Head, Department of Accounting, 4353 TAMU, College Station, TX 77843-4353; Email: j-benjamin@tamu.edu. Review of applications will begin on September 1, 2007 and will continue until the position is filled. Texas A&M University is an Equal Opportunity/Affirmative Action Employer.

165 AMERICAN UNIVERSITY IN BOSNIA AND HERZEGOVINA (AUBIH) has established partnership with State University of New York (SUNY) to offer undergraduate programs in International Financing, Banking, Insurance and Risk Management, Information Technology, Digital Economy, and Business Administration. We invite candidates with Ph.D. to apply for faculty positions at College of International Finance and Banking, and College of Digital Economy and Information Technology at AUBIH. For more information and procedures on how to apply, please visit: http://www.aubih.ba.

166 GEORGE MASON UNIVERSITY, School of Management invites applications and nominations for accounting faculty tenure-line positions at all ranks. Special consideration will be given to candidates with teaching interests in auditing, managerial and corporate governance; and research interests in corporate governance and fraud. Successful candidates will have a Ph.D. (or equivalent) and a strong commitment to excellence in scholarly research and teaching. Located in Fairfax, Virginia, just outside Washington, D.C., the School of Management and accounting program are accredited by AACSB-International (Association to Advance Collegiate Schools of Business). The School of Management offers undergraduate degrees in business, including accounting; and M.S. in administration (M.S.A.), M.B.A., executive M.B.A. (E.M.B.A.) and M.S. in technology management degrees at the graduate level. More information about the GMU's School of Management is available at: http://www.som.gmu.edu. To apply for position number F7418z, go to: http://jobs.gmu.edu. AA/EOE.

167 UNIVERSITY OF ILLINOIS AT CHICAGO, Accounting Department invites applications for one or more tenure-track faculty positions beginning August 2008. The rank of the position(s) is open. Tax is an area of interest. At the Assistant Professor level, a Ph.D., completed or near completion, and strong potential for quality research and teaching is expected. At the Associate or Full Professor level, a Ph.D. and an excellent record of teaching and research consistent with a senior-level appointment is expected. Visit our website for further information at: http://www.uic.edu/cba/. This search will remain open until position(s) is filled. For fullest consideration, submit a letter of interest, *c.v.*, representative publications, and references to: James Pierce, Accounting Search, CBA Academic Affairs (M/C 075), 2202 University Hall, 601 S. Morgan St, Chicago, IL 60607-7124 by January 15, 2208. For information about this position, contact Peter Chalos at: pchalos@uic.edu, Department Head. UIC is an AA/EOE.

168 HUNTER COLLEGE, flagship CUNY college in mid-town Manhattan, seeks applications for one tenure-track position at any level in one of the below listed fields subject to funding availability. Department emphasizes research productivity and strong teaching skills. Assistant Professor candidates should expect completed Ph.D. by September 2008 and show promise of a strong research agenda that will lead to publications. Senior candidates should already have such publications. Applicants should send a *c.v.*, samples of written work, teaching evaluations (if available), and three letters of recommendation to: Recruiting Chair, Department of Economics, Hunter College, 695 Park Avenue, New York, NY 10021 (to attention of Fatma Cebenoyan, if applying for Accounting and Auditing field). Applications accepted until position is filled. Visit http://econ.hunter.cuny.edu/ for department information. An Equal Opportunity/Affirmative Action Employer. Accounting and Auditing, Econometrics, International Business, Corporate Finance, Public Finance, Labor Economics.

169 TEXAS A&M UNIVERSITY, Department of Accounting in the Mays Business School invites applications for an anticipated position beginning in August 2008. This position is open to rank and area of specialization. Applicants should have a doctoral degree in accounting and should have a strong commitment to scholarly research and teaching excellence. Please send a cover letter and resume that includes: (1) educational achievement; (2) research/publication record; (3) indicators of teaching activity/effectiveness or potential; (4) work and other experience; and (5) a list of three references with addresses and phone numbers. All applications should be directed to: James Benjamin, Head, Department of Accounting, 4353 TAMU, College Station TX 77843-4353; Email: jbenjamin@tamu.edu. Review of applications will begin on September 1, 2007 and will continue until the position is filled. Texas A&M University is an Equal Opportunity, Affirmative Action Employer. Review of applications will begin on September 1, 2007 and will continue until the position is filled. Texas A&M University is an Equal Opportunity, Affirmative Action Employer.

170 UNIVERSITY OF CALIFORNIA, RIVERSIDE AGSM invites applications for full-time tenure-track faculty positions in multiple areas to begin July 1, 2008. Although rank and area of interest are open, we are especially interested in hiring scholars at the Associate or Full Professor level. Candidates must have the Ph.D. degree. AGSM is a family-friendly school of management and is sensitive to the needs of dual career couples. Preference will be given to candidates with expertise in: Accounting (Financial Accounting, Audit, and Assurance) Finance, Management, Marketing, Supply Chain Management. File review will begin December 17, 2007 and will continue until position has been filled. Interested candidates should send, a *vita*, list of four to six names as references, and a selected published journal article to: Tanya Wine, Email: tanya.wine@ucr.edu. See http://www.agsm.ucr.edu. The University of California is an Affirmative Action/Equal Employment Opportunity Employer committed to excellence through diversity.

171 CORNERSTONE RESEARCH, a leading economic consulting firm that specializes in analyzing economic, financial, accounting, and marketing issues, is hiring for positions in Boston, MA, Los Angeles, CA, Menlo Park, CA, New York, NY, San Francisco, CA and Washington, DC. Our consultants work directly with esteemed faculty experts in a distinctive "partnership" that combines the strengths of the academic and business worlds. We seek Ph.D. candidates with the ability to apply academic research to real world issues, present concise explanations of complex analyses, and independently manage projects and junior staff. Positions are available for Ph.D. candidates and those with private sector or academic work experience. The ideal candidate will possess a strong empirical background in Financial Accounting, Cost Accounting, or Auditing, technical expertise in accounting, and excellent interpersonal skills. Send a cover letter ranking your location preferences, a resume, a sample research paper, and letters of reference via e-mail to associate-recruiting@cornerstone.com.

CORNERSTONE RESEARCH

FINANCE AND ECONOMICS CONSULTING

Who We Are
Cornerstone Research is a leading finance and economics consulting firm, with more than 400 full-time staff members across six offices. Together with an extensive network of faculty experts, our staff analyzes complex economic, financial, accounting, and marketing issues. Our culture of growth and collegiality provides excellent career prospects to those who have pursued doctoral studies in economics, finance, accounting, or marketing.

Cornerstone Research is involved in a broad variety of cases, and our work has involved high profile cases and legal disputes. Some of our recent cases have involved securities fraud claims, subprime lending issues, allegations of price fixing and monopolization, hedge fund risk management and complex derivative pricing issues, options backdating, patent infringement claims, market timing in mutual funds, accounting allegations, asset valuation, insider trading allegations, corporate governance issues, and large corporate mergers and acquisitions.

Associates and Project Managers at Cornerstone Research
Cornerstone Research provides an interesting and rewarding work environment. Associates and project managers work directly with esteemed faculty experts in a distinctive "partnership" that combines the strengths of the academic and business worlds. Cornerstone Research provides opportunities for associates and managers to develop as testifying experts if they are interested in such a career path.

Associates are central to case work at Cornerstone Research and are involved in all phases of a project. In the initial stages, associates actively participate in the formulation of the work plan and the analysis of issues. As the case progresses, associates handle the complex aspects of a case directly, while managing and advising analysts. They work with senior staff, experts, and clients to develop case strategy and to determine how best to communicate our findings. In addition, associates actively participate in shaping and implementing the firm's recruiting, training, and practice development strategies.

Project managers have substantial experience in case work and are directly responsible for formulating work plans and directing all aspects of a case.

Cornerstone offers an excellent package of interesting work, exposure to a broad set of issues in accounting, economics, and finance, a high degree of personal responsibility, and competitive compensation.

Candidate Profile
We seek Accounting Ph.D. candidates with the ability to apply academic research to real world issues, present concise explanations of complex analyses, and independently manage projects and junior staff. Positions are available for candidates currently completing their Ph.D. program, as well as for more senior candidates with additional private sector or academic work experience. The ideal candidate will possess a strong empirical background in Financial Accounting, Cost Accounting, or Auditing, technical expertise in accounting, and excellent interpersonal skills. CPAs are strongly encouraged to apply. Compensation commensurate with experience.

Interested candidates should send associate-recruiting@cornerstone.com a resume, a sample research paper, three letters of recommendation and a cover letter that includes a statement describing your interest in economic consulting and your location preferences. Please rank our offices in order of your location preference, if any. We have offices in Boston, Los Angeles, Menlo Park (CA), New York, San Francisco, and Washington, DC.

Contact: Recruiting Coordinator – EP Accounting
Cornerstone Research, 1000 El Camino Real, Suite 250, Menlo Park, CA 94025
E-mail: associate-recruiting@cornerstone.com Web page: http://www.cornerstone.com

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NANYANG
TECHNOLOGICAL
UNIVERSITY

A Global University of Excellence

Nanyang Business School, Division of Accounting

Faculty Position in Accounting

The Division of Accounting in the Nanyang Business School (NBS) at Nanyang Technological University, Singapore, invites applications for a faculty position in Accounting at the Associate and Full Professor levels. All research areas will be considered. Visiting positions are also available.

JOB QUALIFICATIONS:
Applicants should possess a PhD in accounting, and have a demonstrated commitment to research and teaching commensurate with rank.

ABOUT THE SCHOOL:
NBS offers undergraduate degrees in Accountancy and Business, MBA degrees and PhD degrees. Our undergraduate accountancy program is highly regarded in the region, and we collaborate with the University of Illinois (Urbana-Champaign) for our accountancy curriculum. NBS is accredited by AACSB and EQUIS; and our Accountancy programs have the AACSB accreditation in Accounting. Our MBA program has been ranked the best in Singapore and third in the Asia Pacific region in the recent Financial Times (FT)'s listing of the top MBAs in the world.

High quality research is strongly encouraged, and is evident from publications by our full-time accounting faculty in The Accounting Review, Journal of Accounting Research, Journal of Accounting and Economics and Contemporary Accounting Research in the past five years. In a 2005 article on the ranking of research productivity in Accounting, we are ranked the top business school in Singapore and the top 3 in Australasia. NBS also co-hosts the International Symposium on Audit Research, a collaboration with the University of Southern California, University of New South Wales, and Maastricht University.

NBS offers competitive salary and benefits in a stimulating research environment. A reduced teaching load is provided to new faculty and research-active faculty, and generous funding support for research and conferences is also available. The School also subscribes to various leading archival databases.

APPLICATION PROCEDURE:
To apply, please refer to the Guidelines for Submitting an Application for Faculty Appointment (**http://www.ntu.edu.sg/hr/faculty_guidelines.htm**) and send your application to: **Faculty Search Committee, Division of Accounting, Nanyang Business School, NANYANG TECHNOLOGICAL UNIVERSITY, S3-01B-51, Nanyang Avenue, Singapore 639798, Fax: (65) 6793-7956, Email: H-Dat@ntu.edu.sg, Website: http://www.ntu.edu.sg/hr/recruit/acad/nbs.htm**